CONTENTS

LIST OF ABBREVIATIONS

ASFR – Age Specific Fertility Rate
AzDHS – Azerbaijan Demographic and Health Survey
CDR – Crude Death Rate
CIS – Commonwealth of Independent States
DHS – Demographic and Health Survey
IOM – International Migration Organization
GDP – Gross Domestic Product
GRR – Gross Reproduction Rate
NRR – Net Reproduction Rate
RHS – Reproductive Health Survey
SSC – State Statistical Committee
TFR – Total Fertility Rate
UN – United Nations
UNHCR – United Nations Refugee Committee
WHO – World Health Organization
et al. – and others

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Chapter 1

Introduction

It is impossible to imagine a world without population forecasts. There is a scientific need for demographic forecasts, as there is a need for forecasts in any social science (Keilman, 1990, Keilman and Cruijsen, 1992). Apparent need for the forecasts, which exists for decision- and policy-makers, implies that population forecasts will always be attempted by someone. Basically, the primary purpose of forecasts is to provide an estimation of future population which is used as a common framework for national planning in a number of different fields. They can be also used in a wide range of ways by government departments, for instance to assist long-term fiscal and economic planning, to forecast future demands for services and to help devise strategies to deal with changing demographics.

The main purpose of the study is to produce a population forecast by sex and one-year age groups for the Republic of Azerbaijan for the period 2009-2050. The forecasting process consisted from the several stages, which are included in the general structure of the production process of a forecast. Basic concepts, process of population forecasting, the cohort-component projection model and the forecasting components development are discussed in chapter 2. Here, due to restrictions of the available data during analysis of the forecasting components, a number of methods were applied. Thus, in order to obtain one-year intensities from available five-year fertility and migration intensities and to use those in the analysis and further incorporation into the cohort-component projection model distributional methods are applied. With regard to mortality, method of reconstruction abridge life tables into complete life tables is applied and mortality in old ages is described by an appropriate model. The estimated intensities were utilized in the current trends analysis serving as a background for forecasting the parameters of the cohort-component projection model. During the process of population forecasting the cohort-component projection model is used and the population is forecasted in three scenarios (variants). Underlying assumptions are based on analysis of the recent demographic trends and an assessment of their implications for future changes. The chapter 3 describes shaping of the population throughout history and more recent demographic development in Azerbaijan. To past and future development of fertility, mortality and international migration is devoted chapter 4. This chapter presents the overview of future scenarios as well. The final results of the forecast are presented in chapter 5.

Chapter 2

Population forecasting methodology

2.1 Basic concepts

According to the IUSSP Multilingual Dictionary, "Population **projections** are calculations which show the future development of a population when certain assumptions are made about the future course of population change, usually with respect to fertility, mortality and migration. A population **forecast** is a projection in which the assumptions are considered to yield a realistic picture of the probable future development of a population" (IUSSP, not dated, p. 90). From the given above definition it follows that projections are conditional, developing the consequences of the assumptions that are made, while a forecast is unconditional: based on current scientific insights, a forecaster gives the best guess of what the future population will be (Keilman, 1990).

However, despite the fact that often terms "projection" and "forecast" are used interchangeably (O'neil et al., 2001) and mostly projections are used as forecasts they both show the most likely future population trends (Keilman and Cruijsen, 1992). It is implied by fact, that demographers do not use (unless they explicitly state so) unlikely variants of future fertility, mortality and migration trends (Keilman and Cruijsen, 1992).

Techniques and models for population forecasting have been already well developed over last more than hundred years and a basic elaborated approach is considered to be the method based on combination of cohorts and components. The total population of a country consists of many cohorts of people. In this context each cohort is represented by males and females born during one period of time (one calendar year or more) within a country or migrated from abroad and joined to a given cohort lately. The cohort-component method of projections produces a future population by moving these cohorts from year to year (or from one point of time to another) by application of three components of population change – fertility, mortality and migration. Estimation of assumptions on components of future population changes underlying the forecast is one of the most crucial stages of the method. The main goal of forecast is to draw general trend line of future population development assuming certain changes in fertility, mortality and migration rates. Effects of wars, famines, collision with a large comet or any other catastrophic events could not be assessed and included to the models. Usually all type of projections are based on an assumption that catastrophes will not occur.

The main issue in the drawing a perspective of future population development is the extrapolation of trends on mortality, fertility and migration observed within a certain period of time. It is obvious that the process of extrapolation should take into account demographic behaviour of the population. However, there can arise a question how to guess such demographic behaviour which will reflect changes of social, cultural, physiological, economic factors for the certain population in future. Evidently, these links are covered by social theories, but in this context it is worth to mention Boudon's ideas (1986) that, when it comes to forecasting definite general laws are beyond the reach of theories of social change, they are partial and local; for the case of demography that view is also supported by Henry (1987). Earlier, Keyfitz's empirical findings led him to the conclusion that contributions of existing social theories have limited value to demographic forecasting (1982). Keyfitz agrees with Nagel's opinion from 1961, that "… (un)like the laws of physics and chemistry, generalizations in the social sciences … have at best only a severely restricted scope, limited to social phenomena occurring during a relatively brief historical epoch with special institutional settings"(Keilman, 2002, p.9). According to Keyfitz (1982), the theory may be true, but it may be imprecise as to the timing of the events it predicts; demographers are not satisfied when they know that a certain event will happen (quantum) without being able to say when, at which age (tempo) (Keilman, 1990). Thus, statements about what may happen are not general laws, they are conjectures which could be formulated as a conditional law of the type "if A, then sometimes B". Following this, it can be assumed that any "generalizations" derived from researches about demographic behaviour and population changes should be accepted as mere hypothesis of a forecast expressed in a number of scenarios.

2.2 Process of population forecasting

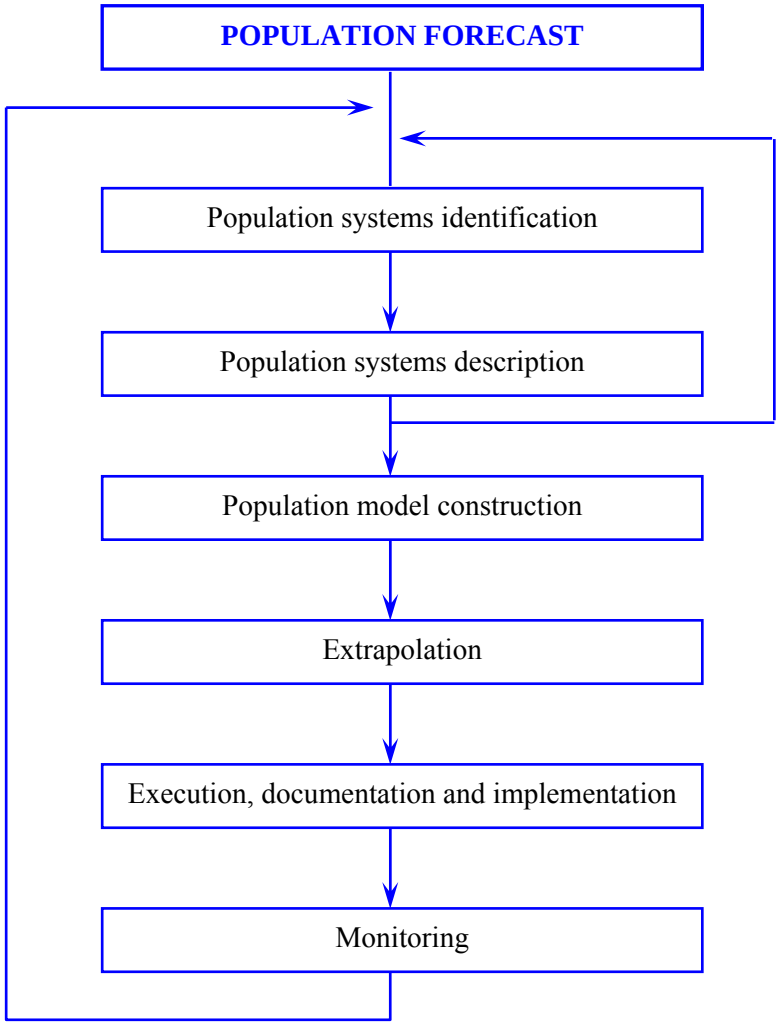
Like forecasts in many other fields, population forecasts are made by using a model, which represents a simplified abstraction of the real world. Generally, construction of a model for a population forecast describing the behaviour of a system can be described by several stages presented in figure 1.

The **first stage** in the production process of a population forecast is the identification of the population system. The population itself (the subject of the system) has to be defined; the population categories (the system elements) should be identified, as well as the relevant demographic events (the relations of the system elements). Several points are important when a forecast considers the characteristics by which the future population should be broken down (Keilman and Cruijsen, 1992, Keilman, 1990, Brass, 1974). The purpose of the forecasts and the user's requirements could indicate which population categories might be relevant. Homogeneous population subgroups, whose behaviour is relatively simple to interpret, can be revealed from theories explaining demographic behaviour (childbearing, migration). It should also take into account, that the number and type of population categories can be restricted by the available data. At the same time too detailed classifications may cause small cell-counts ant this in turn may lead to random fluctuations.

The **second stage** of producing a population forecast is related to the description of the population system. The historical behaviour of the identified population categories is measured and analyzed. When this behaviour is insufficiently understood, a revision of the identification stage may follow. Demographic measurement concepts, time series methods, curve-fitting techniques and multivariate models are the basic tools to be used (Keilman, 1990, Keilman and Cruijsen, 1992).

The **third stage** is the model construction. A model is built which shows a one-to-one correspondence with the population system identified in the first stage. Normally, the model equations are directly based on the demographic measures applied in the second stage. However, sometimes one chooses a more simplified forecast model, for instance by assuming no interaction between mortality and migration.

Fig. 1 – Flow diagram for the construction of a population forecast



Source: Keilman, 1992, p.7

The **fourth stage** of the population forecasting process is the extrapolation of the model parameter values. This stage is considered to be the most crucial one. After all, proper assumptions about the demographic future are more important for the success of a forecast than a sophisticated model (Ascher, 1978). Assumption-making process should base on a systematic

approach, and this may be facilitated by distinguishing several levels at which these assumptions could be formulated (Keilman and Cruijsen, 1992).

1) Detailed assumptions apply to the future trends in age-specific fertility rates, death probabilities by age and sex, etc.
2) Summarizing assumptions are formulated for summary indicators which aggregate the detailed parameters for fertility, mortality and migration. For instance, the total fertility rate, the mean age at childbearing, the life expectancy, the total number of immigrants.
3) General assumptions are statements of a socio-demographic as well as a more general (social/economic/cultural/political/legal) nature. For instance, the assumption that the role of the family will become less dominant, or that legal regulations will have a limited impact on immigration.
4) Disclaimers state that the forecast are not valid in the event of war, natural disaster or major economic crises.

In many situations, it may be useful to start the assumption-making at level 3, followed by the qualitative assessment of the level 2 parameters (rapid increase, stabilization and the like). After quantification, the resulting summary indicators may be disaggregated into detailed parameters at level 1, using standard age schedules.

Different projection techniques may be employed for levels 1-3. The general assumptions may be drawn up by making use of socio-demographic surveys, scenario writing, Delphi methods or simply expert opinions. This also holds true for the qualitative assessment of the level 1 and the level 2 parameters. The numerical values of the detailed and summary indicators may be found by applying extrapolation and interpolation methods, which range from simple graphical extrapolations, analogies to advanced time-series techniques or multivariate explanatory models.

Because of the inherent uncertainty in population forecasting, more than one set of parameter values is often made for a particular component. Two points should be taken into account when choosing the phenomena for which more than one variant should be formulated.

1) The significance of each individual component for the forecast results. These results are more sensitive to changes in one component than to changes in other components.
2) The past course of the components. The more erratic the observed development of a given component, the more difficult it is to estimate its future course.

The most crucial and/or most unstable parameters should be included in the forecast variants.

The **fifth stage** is the execution, documentation and implementation. Execution of the calculations, the assumptions and results are recorded on tables, figures and they are published. The implementation of the produced forecasts become easier when the forecaster and the user belong to the same organization and, otherwise, a situation becomes more complicated if a general-purpose forecast is produced without much knowledge of its users or in competition with other forecasts.

The final **sixth stage** of the production of a forecast is monitoring. Monitoring consists of a comparison between predicted and observed behaviour of the population system and an assessment of the deviations and their impact in the years to come. Hence, this last stage may

also be viewed as a preparation for an updated version of the forecast. The result of the monitoring process may lead to changes in the model parameter values, but sometimes modifications of the projection model and extensions of the description of the population system are inevitable.

2.3 The cohort-component model

Techniques and models for population forecasting have been already well developed over last more than hundred years and a basic elaborated approach is considered to be the **method based on combination of cohorts and components**. The total population of a country consists of many cohorts of people. In this context each cohort is represented by males and females born during one period of time (one calendar year or more) within a country or migrated from abroad and joined to a given cohort lately. The cohort-component method of forecasting produces a future population by moving these cohorts from year to year (or from one point of time to another) by application of three components of population change – fertility, mortality and migration. Estimation of assumptions underlying the forecast is one of the most crucial stages of the method. The **main goal of forecasts** is to draw general trend lines of future population development assuming certain changes in fertility, mortality and migration rates. Effects of wars, famines, collision with a large comet or any other catastrophic events could not be assessed and included to the models. Usually all type of forecasts are based on an assumption that catastrophes will not occur.

Turning to the international history of cohort-component method, it is worth to note that this approach appeared together with the first ideas about demographic forecasting itself. Generally, the demographic forecasting begins with English economist E.Cannan's quantitative prediction of the future growth of the population of England and Wales in 1895. His long term forecast was intended as a direct attack on current official geometrical forecasting methodology. He demonstrated that it was possible to predict with a large degree of likelihood what the direction of future population growth would be if the future influence of the past and present age-cohort structure were taken into account. All ingredients of cohort component methodology were present in that forecast, albeit in rudimentary form. Later this method was reintroduced by Whelpton (1936), formalized in mathematical terms by Leslie (1945), and first employed in producing a global population forecast by Notestein (1945). At the same time it should be mentioned that prior to the mid 20th century, the few global population projections that had been made were based on extrapolations of the population growth rate applied to estimates of the total population of the world (Frejka, 1981, 1994). Thus, starting from 1945 when Notestein applied the cohort-component method it became the dominant one.

The cohort-component model is a discrete-time model of population dynamics. The projection period is usually divided into time intervals of the same length as the age intervals that are employed. For each projection interval, the method basically consists of three steps:

1) project forward the population in each subgroup at the beginning of time interval in order to estimate the number still alive at the beginning of the next interval;

2) compute the number of births for each subgroup over the time interval, add them across groups, and compute the number of those births who survive to the beginning of the next interval;
3) add immigrants and subtract emigrants in each subgroup during the interval; compute the number of births to these migrants during the interval; and forecast forward the number of migrants and the number of their births, that will survive to the beginning of the next interval.

By means of life tables for each sex to survive forward the population alive at the baseline. Survival probabilities are required for each subgroup and the survivors are assigned to the same sex and next age group (since time and age intervals are congruent). Next step is estimation of births by applying fertility rates to females. The third step adds some practical difficulty to the forecast as one needs to forecast not only total number of migrants in each forecast interval but also the timing of migration within the interval, since exposure to birth and death depends on when migrants enter or leave the population.

In its simplest statement, the **c**ohort-component method is expressed by the following equation:

$$P_{t+1} = P_t + B_{t,t+1} - D_{t,t+1} + M_{t,t+1} \quad (1)$$

where P_t is the population at time t;

P_{t+1} – population at time $t+1$;

$B_{t,t+1}$ – births, in the interval from time t to time $t+1$;

$D_{t,t+1}$ – deaths, in the interval from time t to time $t+1$;

$M_{t,t+1}$ – net migration, in the interval from time t to time $t+1$.

Components of population change are forecasted separately, and applied to equation (1). The interval from t to $t+1$ may be of any duration. The cohort-component method is based on similar logic for individual age groups, recognizing that the base population for a given age group is the population at time t. For the moment, let us assume that the time unit is one year, and then next year is $t+1$. The equation is replaced by two equations, depending on whether the age group is zero (meaning under 1) or any other age as of the last birthday, denoted by x.

$$P_{t+1}(0) = B_{t,t+1} - D_{t,t+1}(0) + M_{t,t+1}(0) \quad (2)$$

$$P_{t+1}(x) = P_t(x-1) - D_{t,t+1}(x) + M_{t,t+1}(x) \quad (3)$$

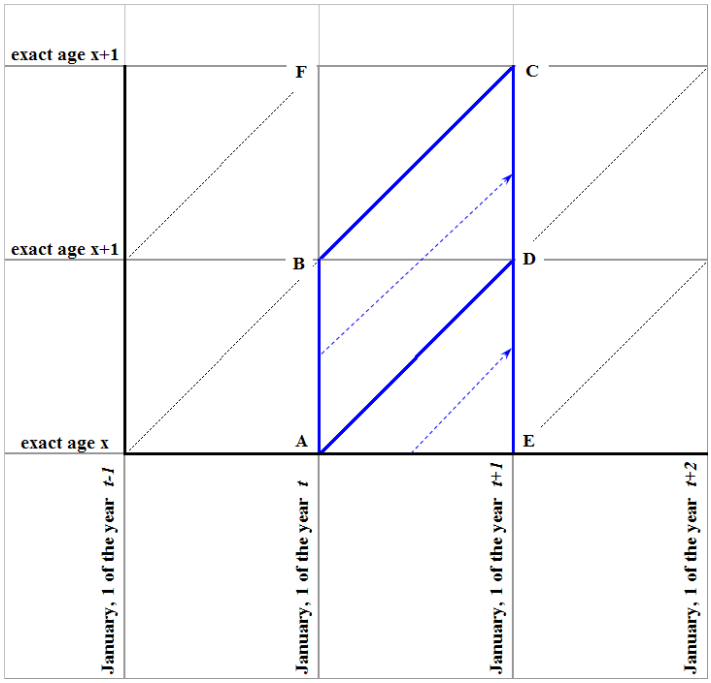
Each of the terms in equations (2) or (3), whether defined as a population or a number of events, relates to people born in a particular year – the birth cohort. While it is essential that age and time in equations (2) and (3) be measured in the same unit, there is no requirement that the interval be one year. The population forecast within this study is done by single years.

The forecast process simply can be illustrated by means of the Lexis diagram. In this widely used diagram, the vertical axis represents the age or the age group, the horizontal axis – time (usually calendar years). The diagonal axes represent the life of an individual or a cohort. Figure 2 illustrates a fragment of the Lexis diagram, where line AB denotes the population at the age x on the 1st January of the calendar year t.

Moving in time – one year later ($t+1$) this cohort will reach the age $x+1$ and will be represented by the line DC. To calculate this population one year later (for $x \geq 0$), it is necessary to forecast deaths and net migration occurring to this cohort between year t and year $t+1$. The

net number of migrants aged *x* between year *t* and year *t+1* is represented by the square ABDE in the Lexis diagram. Similarly, the net number of migrants aged *x+1* between year *t* and year *t+1* is represented by the square BFCD. It can be assumed that half the migrants in a given year at a given age migrate at the beginning of the year and half at the end of the year. So, the first part of migrants will be added to the population represented by the line AB in the diagram and the other half to the population represented by the line ED Similarly, for the age *x+1* in this period, half can be added to the population denoted by the line BF and half to the population represented by the line DC. Net migration in the parallelogram ABCD is therefore obtained by adding half of the net migrants aged *x* (i.e. those adding to the population AB) and half of those aged *x+1* (i.e. those adding to the population DC) in this interval. The number of deaths in a year is obtained by adding half of the net inward migrants at each age to the number in the population at the beginning of the year and applying the mortality rate q_x. This produces, directly, the number of deaths in the parallelogram ABCD.

Fig. 2 – Lexis diagram, forecast



Finally, there is the special case of forecasting the number of infants aged *0* at year *x+1*. This is obtained as described above. So, if *x=0* in figure 2, the required population is represented by the line ED and it is therefore necessary to forecast births, deaths and net migration in the triangle ADE.

So, the construction of future population requires baseline population by sex and same age intervals. The forecast period is broken down into forecast intervals as the length of age intervals. For each forecast interval, we need both a life table representing age-specific mortality conditions assumed to prevail during the interval and a set of age-specific fertility rates assumed to prevail during the interval.

The projection forward of **women** still alive one (or *n*) years later, proceeds by applying survivorship ratios to each group. For any age group, except for the youngest and the oldest, the basic formula is:

$$ {}_nN_x^F(t+n) = {}_nN_{x-n}^F(t) \cdot \frac{{}_nL_x^F}{{}_nL_{x-n}^F}; $$

where ${}_nN_x^F$ *(t)* is the number of women aged *x* to *x*+*n* at time *t* and the $\frac{{}_nL_x^F}{{}_nL_{x-n}^F}$ – is the survivorship rate, the proportion of the person aged *x*-*n* to *x* that will be alive *n* years later in a stationary population (from the appropriate life table) and *n* is the interval of age group.

For the open-ended age group, we need to combine survivors from two previous age groups:

$$ {}_\infty N_x^F(t+n) = \left({}_nN_{x-n}^F(t) \cdot \frac{{}_nL_x^F}{{}_nL_{x-n}^F} \right) + \left({}_\infty N_x^F(t) \cdot \frac{T_{x+n}^F}{T_x^F} \right); $$

The first product is the number of surviving women who were in the *n*-year age group immediately before the open-ended age group at time *t*. The second product is the number of survivors among women already in the open-ended age group at the beginning of the forecast interval.

Lastly, we need to estimate the number of surviving females in the first age group. For this purpose, we need to forecast the number of births during the forecast period using age-specific fertility rates (F_x).

$$ {}_nF_x \cdot n \cdot \left[\frac{{}_nN_x^F(t) + {}_nN_x^F(t+n)}{2} \right] = {}_nF_x \cdot n \cdot \left[\frac{{}_nN_x^F(t) + {}_nN_{x-n}^F(t) \cdot \frac{{}_nL_x^F}{{}_nL_{x-n}^F}}{2} \right] $$

The number of births to woman is obtained by:

$$ {}_nB_x(t,t+n) = n \cdot {}_nF_x \cdot \left[\frac{{}_nN_x^F(t) + {}_nN_{x-n}^F(t) \cdot \frac{{}_nL_x^F}{{}_nL_{x-n}^F}}{2} \right] $$

Then it is necessary to sum births across age groups of the mother:

$$ {}_nB_x(t,t+n) = \sum_{x=\alpha}^{\beta-n} {}_nB_x(t,t+n), $$

where α and β are the lower and upper bounds of the childbearing ages. The number of female births is then obtained by applying the sex ratio:

$$ B^F(t,t+n) = B(t,t+n) \cdot \frac{1}{1+sex\_ratio} $$

Finally, the number of females will be:

$$ {}_nN_0^F(t,t+n) = B^F(t,t+n) \cdot \frac{{}_nL_0^F}{n \cdot l_0} $$

The male population could be projected in a similar manner using a male life table. Thus,

$$ {}_nN_x^M(t+n) = {}_nN_{x-n}^M(t) \cdot \frac{{}_nL_x^M}{{}_nL_{x-n}^M}; $$

where ${}_nN_x^M(t)$ is the number of men aged *x* to *x+n* at time *t* and the $\frac{{}_nL_x^M}{{}_nL_{x-n}^M}$ – is the survivorship rate, the proportion of the person aged *x-n* to *x* that will be alive *n* years later in a stationary population (from the appropriate life table) and *n* is the interval of age group.

For the open-ended age group:

$${}_\infty N_x^M(t+n) = \left({}_nN_{x-n}^M(t) \cdot \frac{{}_nL_x^M}{{}_nL_{x-n}^M} \right) + \left({}_\infty N_x^F(t) \cdot \frac{T_{x+n}^M}{T_x^M} \right);$$

The number of male births will be:

$$B^M(t,t+n) = B(t,t+n) \cdot \frac{sex\_ratio}{1+sex\_ratio}$$

Finally, the number of males:

$${}_nN_0{}^M(t+n) = B^M(t,t+n) \cdot \frac{{}_nL_0^M}{n \cdot l_0}$$

At the same time it should be noted, that in application of the cohort-component method it is worth to use the matrices method. More detailed in can be found in Bernardelli (1941); Lewis (1942); Leslie (1945, 1948); Keyfitz (1970). There is no additional concept, only summarization of procedures described above.

2.4 Forecasting components development

2.4.1 Fertility

Basically, formulation of the assumptions about future reproductive behaviour and the course of fertility are expressed through the age-specific fertility rates. In this study, the available data provided by the State Statistical Committee of the Republic of Azerbaijan on live births were organized by age of mother in standard five-year age groups. Corresponding age structures were available in the same detail. Basic analysis and assumptions on future course of fertility were done and formulated on the level of five-year age specific fertility rates and controlled over the TFR values calculated in the abbreviated fertility tables.

Regarding calendar time only the key-year values (for the years finishing by 0) were estimated in the first step representing the first approximation to the required fertility forecast. In the second step these key-year aggregated values were re-calculated into detailed one-year age-specific fertility rates using a model redistribution scheme. This redistribution scheme was derived solely for the purpose of this forecast on the background of analogical age distribution of fertility found in the Czech Republic population history.

Historically, during most of the second half of the 20th century, fertility in the Czech Republic was characterized by a very young age structure of mothers, similar to that observed in Azerbaijan nowadays. Young age-structure characterized fertility in the Czech Republic until the beginning of the 1990s. Nevertheless, structurally the closest to the 2008 Azerbaijani patterns of fertility was identified fertility of the Czech Republic females as it was recorded in the year 1961. Detailed structure of this distribution was therefore taken as a basis for the model

structure for fertility of females living in Azerbaijan in the year 2008. After necessary corrections the model 2008 detailed age structure of fertility for Azerbaijan was obtained and its further transformation was estimated for the key-years. In the following step, the assumption of linear transformation of values for corresponding one-year groups was adopted and the values of the projection model parameters for the interjacent calendar years were derived accordingly. Variants predefined on the level of five-year ASFR and again controlled over the TFR were derived in the same way employing partial scenarios on fertility trends in the single five-years segments of age structure. Obtained batteries of parameters were used in the next stage of forecasting, for application of the cohort-component model and related projection calculations.

2.4.2 Mortality

Basic analysis and assumptions on future path of mortality presented in the study based on data arranged by five-year age groups from the State Statistical Committee of the Republic of Azerbaijan and World Health Organization (WHO) Mortality Database documentation (21 July 2008 update). The assessment of data on accuracy and reliability revealed the inconsistency in the population size at old ages, which caused an overestimation as well as irregularities in life expectancy values for the old ages. It has to be admitted, that insufficiently developed system of statistics and registration leads to the uncertainty in survivors, particularly from the cohorts born until World War II. Moreover, provided by statistics population data for five-year age intervals with the ending age 85+ deprives of observing trends of life expectancy in older ages. In order to eliminate such irregularities with further estimation of mortality indicators and application in the forecasting model it was necessary to rearrange aggregated by five-year age groups data to one-year age groups by means of distributional methods and describe mortality in old ages through the appropriate model.

With regard to redistribution of mortality indicators by one-year ages it was required to calculate complete life tables from abridge life tables. Generally speaking, the only way to reconstruct abridge life tables into complete ones is the interpolation method. The outcome of such exercises is likely to depend on the interpolation formulas used. However, it needs to be kept in mind that interpolation procedures cannot recover the true series of events, but they can provide smooth, reasonable and internally consistent annualized estimations of indicators.

Essentially, it is needed three kinds of interpolation schemes:

1. for very young (0-1) and young ages (1-9);
2. for the broad class of ages (10-74);
3. for very old ages (75 and above).

The use of six point Lagrangian interpolation formulae over the age 1-74 and then application of smoothing curve by fitting one of the models for ages above 75 represents satisfactory results. Special methods are needed for the first year of life. Using the six-point Lagrangian formula for interpolation of any tabulated function u_x (in our case u_x represents l_x) and following the method described by Abramowitz and Stegun (Johnson, 1999, Abramowitz and Stegun, 1965) there were obtained values of l_x. The six-point Lagrangian coefficients needed for formulas are presented below (tab. 1).

Tab. 1– Six-point Lagrangian coefficients for interpolation on values u_x

Coefficients of u_x to obtain:	**Coefficients to be used for *x < 10***					
	x = 0	**x = 5**	**x = 10**	**x = 15**	**x = 20**	**x = 25**
u_1	0.612864	0.766080	-0.680960	0.437760	-0.161280	0.025536
u_2	0.344448	1.148160	-0.861120	0.529920	-0.191360	0.029952
u_3	0.167552	1.256640	-0.718080	0.418880	-0.147840	0.022848
u_4	0.059136	1.182720	-0.394240	0.215040	-0.073920	0.011264
u_6	-0.025536	0.766080	0.383040	-0.170240	0.054720	-0.008064
u_7	-0.029952	0.524160	0.698880	-0.262080	0.080640	-0.011648
u_8	-0.022848	0.304640	0.913920	-0.261120	0.076160	-0.010752
u_9	-0.011264	0.126720	1.013760	-0.168960	0.046080	-0.006336
when u_1 *is* used	**x = 1**	**x = 5**	**x = 10**	**x = 15**	**x = 20**	**x = 25**
u_2	0.562030	0.717600	-0.478400	0.283886	-0.100716	0.015600
u_3	0.273392	1.047199	-0.531911	0.299200	-0.103747	0.015867
u_4	0.096491	1.108800	-0.328533	0.172800	-0.058358	0.008800
u_6	-0.041667	0.798000	0.354667	-0.152000	0.048000	-0.007000
u_7	-0.048872	0.561600	0.665600	-0.240686	0.072758	-0.010400
u_8	-0.037281	0.333200	0.888533	-0.244800	0.070147	-0.009800
u_9	-0.018379	0.140800	1.001244	-0.160914	0.043116	-0.005867
Coefficients of u_x to obtain:	**Coefficients to be used for *x > 10***					
	x = 5m-10	**x = 5m-5**	**x = 5m**	**x = 5m+5**	**x = 5m+10**	**x = 5m+15**
u_{5m+1}	0.008064	-0.073920	0.887040	0.221760	-0.049280	0.006336
u_{5m+2}	0.011648	-0.099840	0.698880	0.465920	-0.087360	0.010752
u_{5m+3}	0.010752	-0.087360	0.465920	0.698880	-0.099840	0.011648
u_{5m+4}	0.006336	-0.049280	0.221760	0.887040	-0.073920	0.008064

Souce: Elandt-Johnson, 1999, p.112

The ages 1-9. If the abridge life table includes only values of l_x by five-year age groups, it should be used the coefficients in the upper part of the table 1. The first set of formulas is for computing l_x, where x = 1, 2, 3, 4, 5, 6, 7, 8 and 9, as a linear combination of l_0, l_5, l_{10}, l_{15}, l_{20} and l_{25}. Hence, for example, the calculation of l_2 would be as following:

$$l_2 = 0.344448l_0 + 1.148160l_5 - 0.861120l_{10} + 0.529920l_{15} - 0.191360l_{20} + 0.029952l_{25}$$

However, most abridge life tables contain l1. In this case, the second set of coefficients from the Table 1 should be used.

The mortality in the first year of life is very different from that in the second and subsequent years, and if l_1 is available, the second set of coefficients is recommended to use.

The ages 10-74. The last set (for $x > 10$) of coefficients in the Table 1 is used in this case. For example, to calculate l_{11}, we put $m = 2$, so that we have:

$$l_{11} = 0.008064l_0 - 0.073920l_5 + 0.887040l_{10} + 0.221760l_{15} - 0.049280l_{20} + 0.006336l_{25}$$

The ages 75 and above. For the ages above 75 it is common to interpolate probability of dying using a fitted model of smoothing. Due to discovered overestimation in life expectancy at old ages application of the model was required not only to obtain mortality indicators for single ages but also to eliminate fluctuations in life expectancy.

There are a number of authors known for their contribution to development of such models expressing relation between age and force of mortality. Well-known Gompertz model suggested almost about two centuries ago and improved by Makeham some years later in 1860 has been largely used for years to describe mortality changes with age. Thereafter many efforts have been made to find more appropriate model that fits to young and old ages. Recently made comparison

of results from application of different models to mortality at the oldest old ages in the Czech Republic (Burcin, Tesárková, Šídlo, 2009) illustrated that in regard to old ages Kannisto (1992) and Thatcher (1999) models better fit and corresponds to reality than others. The Zeng and Vaupel findings (2003) also showed that the Kannisto's method is one of the best models in fitting the oldest old mortality for Han Chinese (Zeng Yi et al., 2008).

In the current study due to uncertainties concerned with mortality rates at old ages the Kannisto model (1992) was chosen. The Kannisto model is based on a logistic function, for which the logit transformation of the mortality rate can be expressed as a linear function of age (E.Coelho et al., 2007). The model is defined by the following formulae:

$$\mu_x = \frac{e^{[\theta_0 + \theta_1 (x-80)]}}{1 + e^{[\theta_0 + \theta_1 (x-80)]}}, \qquad x \geq 0,$$

where $\theta_i \geq 0$ (i =0, 1) and μ_x denotes mortality force for the age x.

Finally, after necessary corrections the adjusted and smoothed age structures of mortality by single years of age were obtained for the period 1981-2008. These estimated intensities of mortality were utilized in the current trends analysis serving as a background for forecasting the parameters of the cohort-component projection model.

2.4.3 International migration

Low reliability of migration data induced low reliability of the analytical results, especially in the case of more significant component of migration, i.e. emigration outflow. Taking into account that underestimation of migrants does not automatically mean less representative relative structures of the principal migration streams, it is assumed that undercounting is random process which results in random sample. Under such an assumption it is possible to analyze and to some extent judge stability of sex and age structures of international migrants. Low reliability of migration volume data, low forecastibility of migration and significantly stable empirical relative sex and age patterns of immigration and emigration led to adoption of the assumption on constancy of sex and age specific net emigration rates, net migration and the relative structure of immigrants.

These mentioned facts signalize that migration components were incorporated into the projection model in two different ways. Immigration was incorporated in the terms of the absolute numbers of immigrants by sex and age, and emigration like detailed one-year intensities of emigration separately for males and females. The volumes of immigration in particular calendar years were determined by corresponding volumes of emigration and net migration. This approach is generally understood as a most rational way of incorporation of migration into the classical cohort-component projection methods, regardless than in the official population forecasting practice direct incorporation of net migration divided by sex and age is used. It, however, did not give a chance to adopt future migration estimates to changing size and sex and age structure of the forecasted population.

Chapter 3

Population development overview

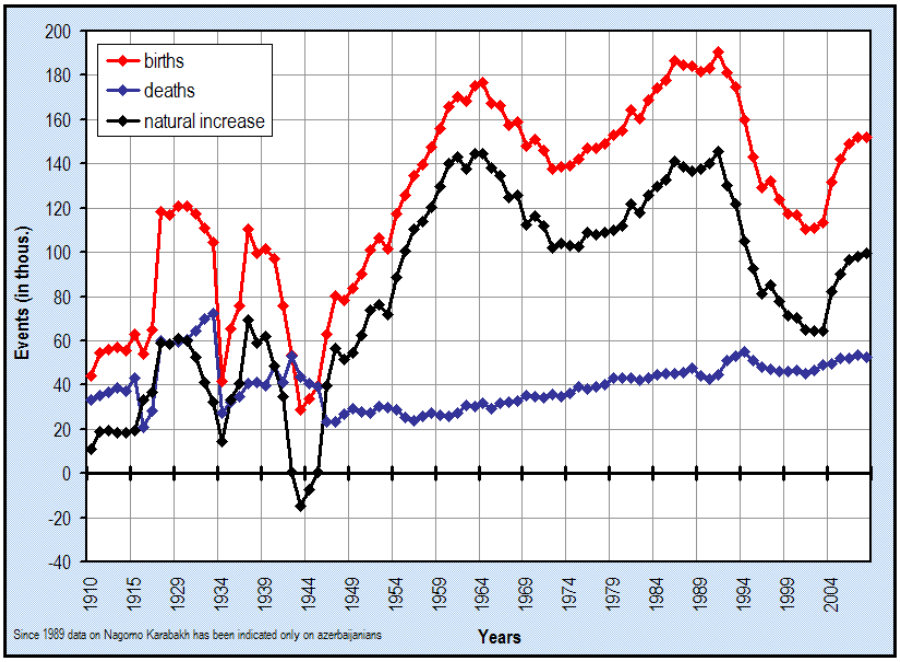
3.1 Shaping of the population throughout history

The past hundred years in Azerbaijan's population history has been a time of rapid, qualitative and often dramatic changes. Since the first population census (1897) the population of the country has grown from 1.8 to 8.9 million persons. Generally, population development of the Republic of Azerbaijan can be conditionally divided into **ten basic periods** (fig. 3).

The first period covers 1897-1926 (it is a period when Azerbaijan was a part of Imperial Russia). Development of oil industry (the oil production has increased from 26 thousand in 1872 to 11 million tons in 1901), development of transport infrastructure (building of a trunk-railway of Baku-Tbilisi and exit on the European region in 1883) and growth of migration flows from all Russian Empire considerably influenced on the population growth. At the same time the urbanization process has sharply increased (during 1863-1914 the population of Baku had increased by 17 times). However, starting from 1914 population growth dramatically declined. First of all, it was a result of World War I, the revolution of 1917 in Russia, political transformations, economic depression and other events such as mass killings, repressions, expatriations. Over this period the population reduced almost to 17 per cent, the negative balance has made 481 thousand persons. The natural increase for this period has averaged barely 12 thousand a year. Demographic development rather stabilized over subsequent years of the period. Thus, population growth has made 18.6 per cent, average annual increase – 2.45 per cent.

The second period covers 1926-1930 when all efforts of workers of the Soviet Azerbaijan Republic have been directed on socialist industrialization, mainly on reconstruction of oil fields and creation of new industries. Achieved positive trends in the national economy significantly influenced on occupational patterns of the population and had impact on changes in the social structure of the society. With regard to the population development, the period was characterised by high fertility and mortality rates. Hence, the natural increase grew from 15.9 to 23.4 persons per 1000 in the period 1926-1930, the birth rates increased by 67 per cent from 28.1 in 1926 to 47 births per 1000 in 1930. Over the same period simultaneous increase was observed in death rates, they rose by 93 per cent from 12.2 to 23.6 deaths per 1000. In sum, due to natural increase the population increased by 16 per cent, while the total change represented 11 per cent.

Fig. 3 – Births, deaths and natural increase, Azerbaijan, 1910-2008



Source: State Statistical Committee of the Republic of Azerbaijan

The third period – the period of collectivization of the Republic, includes 1931-1935 years. The process of reorganization of villages gave an impulse to population changes and slowed down population growth. Birth rates temporary declined from 43.8 to 22 births per 1000 inhabitants, death rates decreased from 24.1 to 10.8 deaths per 1000, natural increase fell from 19.7 to 11.2 per 1000 and consequently population increased by 10 per cent.

The fourth period is the period of "prewar" years (1936-1940), when socialist industrialization, agriculture collectivization, a cultural revolution changed basic patterns in the life of many Azerbaijanians, as well as all the Soviet society of that time. A noticeable social and economic progress has played an essential role in the natural increase of the population for that period. Thus, the birth rate constituted 23.3 and death rate – 14.3 deaths per 1000 in 1940.

The fifth period – years of World War II. Due to evident reasons, mortality rates significantly increased, fertility dropped and natural increase approximated to the level of simple reproduction. The population of Azerbaijan has fallen from a mark of 3.3 in the beginning of 1940 to a mark of 2.7 million persons in the beginning of 1945 and decreased by 17.4 per cent. When the war was over, people started to revert to prewar life styles and to the pre-war reproduction regime of the population, but the decrease was so tangible that the population of the country has reached its pre-war level only in 10 years that is in 1955.

The next **sixth period** of the demographic development is the post-war period 1946-1960. Despite certain consequents of the war, population reproduction was characterized by accelerated rates. Thus, over the years since 1946 the birth rate increased by 86 per cent (from 22.9 to 42.6 per 1000), meanwhile the death rate decreased by 21 per cent (from 8.5 to 6.7 per 1000). The population natural increase started to grow rapidly and by 1950 constituted 21.6 per 1000, by 1960 – reached 35.9 people per 1000 inhabitants. Such high rates of the natural increase have ever been observed neither in previous, nor the next years in Azerbaijan.

The characteristic feature of **the seventh period** (1960-1971) was a decline in birth rates. Thus, the birth rate dropped by 35 per cent from 42.6 in 1960 to 27.7 persons per 1000 in 1971. That was a consequence of less numbers in the generations of mothers born in the days of World War II. Simultaneously, the continuous decrease of birth rates was accompanied by stable values of death rate (at about 7 deaths per 1000).

The eighth period covers the period 1972-1988; the basic feature of the period is the stabilisation of the population natural increase at the level of 18-20 persons per 1000 inhabitants annually. Steady growth of population wellbeing and development of the social infrastructure was observed during this period. Thus, for example, incomes per capita increased by 40 per cent, number of the educated persons – on 1.5 time, number of physicians – 2 times and etc. All mentioned facts have directly affected on demographic development (decline of infant and children mortality, increase of marriages and reduction of divorces and etc.).

The current period of the demographic development of the country started in 1988. Conditionally it could be divided into several parts. The period which covers 1988-1994 is a period of recession trends in all spheres of life, the period of political stability since 1995 with its consequences on the country's life with further (starting from 2002) recovery trends in population development. In 1988-1993 decreased natural increase of the population illustrates the aggravation of the demographic situation in that period. At the heart of demographic problems of that period underlie two factors. The first – despite considerable social and economic development achieved by Azerbaijan during the Soviet period, the social and economic policy in the former USSR, which was built on political totalitarianism with its' reckless of natural, historical, social and economic, cultural and other specific features of a country has led to deterioration of the demographic situation and an aggravation of problems of employment, ecology, migration etc. The second – collapse and disintegration of the USSR, political, social and economic crisis of 1988-1993 aggravated by the situation in and around Nagorno Karabakh and its consequences created unfavourable situation which lead to aftereffects on the level of demographic indicators. In a short historical period, demographic problems were transformed into social problems on the country level. Then after some political changes in the country since 1995 the period of stability and recovery with further socio-economic growth reflected in all spheres of life is started.

3.2 Recent demographic development

Going into details on the analysis of the recent population development of the country, it should be said that towards the end of the twentieth century the Republic of Azerbaijan gained its independence and started a new period of its development. Over this period some fundamental changes occurred in the country. Similar to all post-socialist countries after collapse of the USSR, Azerbaijan faced social and economic problems of the transition period. Turning back to the events of the early 1990s, it should be said that all spheres of the economy experienced recession trends. The majority of industrial enterprises stopped or reduced a production at a level of 15-20 per cent from the total capacities. Decrease in the overall industry production had made 23-24 per cent annually, in the agricultural production – 15-20 per cent, in capital

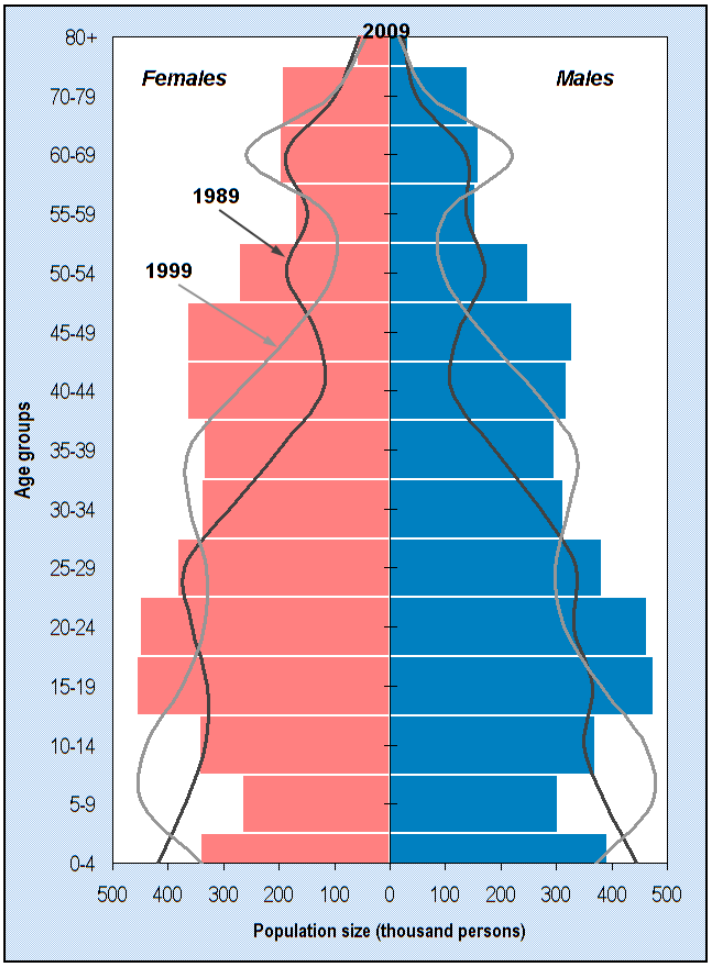
investments – 40 per cent. The GDP per capita dropped by almost 52 per cent from 347 in 1990 to 180 US dollars in 1993. Under influence of the rapid inflation there was observed a sharp depreciation of newly introduced currency – Azerbaijani manat and rise of consumer prices (in 4.5 thousand times). There were undertaken some relevant measures with the aim to relieve the social tension in the country such as salaries increase by 2-3 times, implementation of different types of social allowances. Unfortunately, they were not supported by real economic resources of the country at that time and just even more accelerated the process of inflation. In these conditions the well-being of the population was gradually deteriorating. According to official statistics 35 per cent of the population had per capita incomes below the national minimum subsistence level in 1990. Average monthly wages were about 30 per cent below the average for the USSR. Extremely negative impact on the already unfavourable social and economic situation of that period had the military actions in and around Nagorno Karabakh with consequent effects – occupation of 20 per cent of Azerbaijani lands, forced abandonment of more than 4 thousand industrial and agricultural facilities, deprivation of more than 300 thousand work places, and occurrence of about one million refugees and internally displaced persons. It is obvious, that all mentioned factors to some extent influenced on population development. Roughly speaking, the period was characterized by increased mortality rates, declined fertility and large migrant flows from the country.

Thereafter, reforms conducted during the last fifteen years in the Republic of Azerbaijan, have ensured establishment of macro-economic stability in the country, promoted dynamic development of the economy and considerably improved the welfare of the population. Thus, implementation of relevant measures within the framework of state policy aimed on achievement sustainable economic development lead to decrease of the poverty level from 60 to 13 per cent, unemployment rate from 17 to 6 per cent. At the same time between 1995 and 2008 minimal pensions and minimal salaries increased by 68 times, average wages and salaries – by about 23 times. Hence, achievements in the social and economic life of the country to a certain extent caused changes in the population development as well.

In this context it is worth to note, that people's economic behaviour and needs vary at different stages of life and changes in a country's population age structure can have significant effects on its economic performance. It is obvious, while young people require investment in health and education, prime-age adults supply labour and savings, and the elderly require health care and retirement income (Bloom et al., 2001). For example, according to "pessimistic" theory it is considered that population growth restricts economic development of the country (Coale and Hoover, 1958; Bloom and Canning, 2001). More "optimistic" concept is focused on ideas about opportunities and possibilities for the stable economic development initiated by new forms of innovations. They assume that population growth will create pressure on resources and this in turn may encourage daring innovations and new technologies (Bloom and Canning, 2001). At last, proponents of the "neutralistic" views consider insignificant the effect of population change on economic development (Kelley, 2001). However, a conclusion from debates over the effects of population change on economic development is only one – that despite the positive, negative or neutral effect, the relation between them exists. Thereby the component of age structure is likely to be the most important variable.

Age structure of the population is not only a result of previous trends, but also a significant indicator of future demographic changes. Previous trends of population development discussed earlier and they are reflected in population pyramids presented by figure 4.

Fig. 4 – Age and sex structure of the population of Azerbaijan, 1989, 1999, 2009



Note: Constructed population age and sex structures based on the preliminary data from census 2009 and census data 1989 and 1999
Source: State Statistical Committee of the Republic of Azerbaijan

In order to illustrate changes occurred in the population age structure there were constructed population pyramids on the basis of census data 1989, 1999 and preliminary data from 2009 census. In the period between census 1989 and 1999 the population of Azerbaijan increased by 13 per cent that is in comparison with other periods indicates a decrease in population growth rate. Since 1989 population growth rate was decreasing from 1.6 to 1.0 per cent. In 1991-1994 due to losses related to the military actions in the Nagorno Karabakh there was observed a temporary increase of death rates, but establishment of the cease-fire regime contributed to the stabilization of the situation and steady decline of mortality rates. Thus, over the whole period 1990-2000 a slight decline of CDR by 3 per cent from 6.1 to 5.9 per 1000 persons was achieved. At the same time, the crude birth rates dropped by 43 per cent from 25.5 to 14.6 per 1000

population and, in general, starting from 1992 gradual transition from high to lower fertility rates has started.

Thereafter, between next censuses (1999-2009), population of the county has increased by about 12 per cent. The annual growth rate rose from 1.0 to 1.3 per cent. Hence, as it was mentioned earlier started from 1992 the birth rate was gradually declining and in 2002 reached its minimum at the level of 13.6 per 1000 persons. Consequently, in comparison with the end of 1999 in the end of 2009 birth rates increased by 20 per cent from 14.6 to 17.6 per 1000 population. In 2000-2008 mortality remained at approximately the same level of 6 deaths per 1000 inhabitants.

Evaluating the role of migration in the population structure it is necessary to note with regret that a lack of data prevents from in-depth analysis of this component. However, according to available data provided by the State Statistical Committee, net migration being considerably higher in 1989 and in the early 1990s was permanently decreasing but remained negative over the period 1989-2007. During this period the number of emigrants dropped from 138 thousand to 3.1 thousand persons (by 98 per cent); the falling numbers were also observed among immigrants – from 84.3 thousand to 2.0 thousand persons (by 98 per cent). The 2008 went down in the migration history of the country – there was indicated a positive migration balance (1100 persons). Despite the fact that these low emigrant numbers raise doubts about real situation, they illustrate the general trend of migration flows. Instability of the transition period impelled people to leave the country in the 1990s but, in the course of time, successful implementation of the policy oriented on sustainable social and economic development makes the country more attractive to people to immigrate.

Concluding the discussion about population age structure, is should be noted, that regardless of future levels of fertility, mortality and migration, age structure might have either positive or adverse impact on population growth. For instance, in the population with "suddenly" changed pattern from high fertility rates to the lower ones the population growth of the country may not immediately change from positive to negative. It will become apparent in the case, if these low birth rates remain constant for a long time. The same is for mortality. It needs time to reveal changes in the population size and structures. In other words, even if total fertility rates have been reduced to the replacement level, the population will continue to grow until time, when this cohort and their successors have not passed through their reproductive years. This process became known as a population momentum, the term was introduced by P.Vincent in 1945. For example, due to the effect of population momentum alone, the population of developing countries as a whole is expected to increase by 40 per cent between 1995 and 2100 (Bongaarts, 1999, Bloom, 1999).

Another important characteristic of the population is the sex structure that is a distribution of population by sex according to age groups. Generally known, that in concordance with biological laws the proportion of males is higher then proportion of females among live births (the natural sex ratio at birth is about 106 males to 100 females). Later as children get older this imbalance disappears and in the course of time approaching to old ages females outnumber males. However, the Azerbaijan national statistics reveals an interesting fact of deviations in sex ratio at birth. Deviations in sex ratio at birth started to appear years before – in the early 1990s –

and ultimately the increase was so rapid that nowadays the ratio has reached a level of 117-118. As it is seen from the table below (tab. 2), the smoothing of the sex imbalance is shifting to higher ages in time. It should be noted that in 90s sex ratio in higher age groups was under influence of high male mortality, especially in the 15-39 age group, caused by losses in the military conflict with Armenia in the early 90s. As a result, compared to 1990 number of males per 100 females in the 35-44 age group decreased from 95-94 to 89-88 in 2008. Improvements in health-care system, strengthening of social protection of population and general increase of wellbeing in the country influence on the decreasing mortality level and their effects are more visible for male population. Mentioned factors contribute to the fact that sex balance is shifting by several years up in time.

Tab. 2 – Sex ratio of the population of Azerbaijan, 1990-2009

Age groups	1990	2000	2005	2006	2007	2008	2009
0	107	115	117	116	117	117	116
1-4	106	110	116	117	117	117	117
5-9	106	106	111	112	114	115	116
10-14	105	105	106	106	107	108	109
15-19	109	103	105	105	105	105	105
20-24	96	95	103	104	104	104	104
25-29	88	90	95	96	98	100	101
30-34	93	89	90	90	91	92	93
35-39	95	92	89	89	89	89	89
40-44	94	95	91	90	89	89	88
45-49	94	95	94	93	93	92	91
50-54	90	93	93	93	92	92	92
55-59	92	87	90	90	91	90	90
60-64	85	83	84	84	84	86	85
65-69	61	84	78	78	78	77	78
70-74	48	79	77	78	75	75	73
75-79	50	53	72	71	73	72	73
80-84	43	40	48	56	57	59	61
85+	37	33	36	36	41	44	47
Total	95	96	97	97	97	97	98

Source: own calculations based on data from the State Statistical Committee of the Republic of Azerbaijan

Raised sex ratio is one of the conspicuous changes occurred within recent decades in the sex structure of population of Azerbaijan. The impact of this phenomenon is already visible in the sex composition of children in schools and causes concerns in the society. It is noteworthy, that debates over this issue have been already proceeded with discussions on the draft of the Law on reproductive health and family planning in the Parliament in November, 2009. It is assumed that the adoption of the Law might provide a basis for implementation of necessary activities towards the prevention of selective abortions (for instance, to some extent through the control of prenatal sex determination).

Returning to the issue of the population distribution among age groups it is worth to say that it is an important issue in understanding patterns of current and future population development. During recent decades we are facing an increasing awareness of the population aging all over

the world as well as in the global development context. Azerbaijan Republic is keeping abreast of global trends as well. As it is seen from table 3, over the period 1990-2009 population over 65 increased by 73 per cent, the young population decreased by 16 per cent. Meanwhile, it is observed steady growth of the working age population. Within the period 1990-2009 population in the 15-59 age group has risen by 42 per cent and in 2008 it has constituted 68.6 per cent from the total population of the country. As it was stated above the population of the county is greying and it also reveals in the median age (the age at which exactly half the population is older and another half is younger); compared to 1990 it has increased from 23.9 to 28.8 years.

In order to interpret correctly presented in table 3 indexes some definitions must be given. The aging index is defines as a number of persons aged 60 and older for 100 children aged 0–14. The dependency index I or the youth dependency ratio – is a number of children aged 0–14 per 100 persons aged 15–59. The dependency index II or the old age dependency ratio – is a number of persons aged 60 and older for 100 persons aged 15–59. The economic burden index – number of children aged 0–14 and number of persons aged 60 and older for 100 persons aged 15–59. Roughly speaking, the last three indexes illustrate a burden on the working age population, following these explanations and numbers from the table it is seen that for 2009 there were 46 children and old men per 100 people at working age.

Decline of youth dependency ratio significantly contributes to future shapes of age structure, leads to incremental burden on the working age population and accelerates aging process. However, there are opinions that this decline positively influences on the macro economy and contributes to the economic growth. For instance, it is a case of the "economic growth miracle" in East Asia, where 1.37-1.87 per cent of the growth in GDP per capita could be explained by impact of population dynamics (Prskawetz et al., 2006). At the same time according to the following quotation from the recent research conducted by A. Prskawetz et al. (2006, p. 11): "in East Asia, the growth in GDP per capita attributable to demographic influences is projected to be negative between 1990 and 2025, … a loss of 0.14 to 0.44 percentage point up to 2025. According to the same sources, countries in South Asia are projected to gain from their demographic changes in the future".

Tab.3- Population age composition, Azerbaijan, 1990-2009

Characteristics	1990	1995	2000	2005	2006	2007	2008	2009
Relative structure (in per cent)								
0-14	32.9	32.5	30.9	25.4	24.5	23.8	23.2	22.7
15-59	59.1	58.7	59.9	65.6	66.7	67.5	68.1	68.6
60-64	3.2	3.3	3.5	2.0	1.7	1.6	1.7	2.0
65+	4.8	5.5	5.7	6.9	7.1	7.1	7.0	6.8
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Index (1990=100)								
0-14	100.0	106.0	105.4	90.4	88.1	86.5	85.2	84.3
15-59	100.0	106.4	114.0	130.0	133.6	136.7	139.5	142.0
60-64	100.0	110.5	122.5	73.8	61.9	60.1	64.1	76.9
65+	100.0	122.3	134.0	170.0	175.5	176.9	176.6	172.9
Total	100.0	107.2	112.4	117.0	118.3	119.6	121.0	122.4

Median age (in years)								
Total	23.9	25.0	25.7	27.6	27.9	28.2	28.5	28.8
males	22.5	23.8	24.3	26.1	26.4	26.6	26.9	27.2
females	25.1	26.4	27.0	29.1	29.5	29.8	30.1	30.4
Aging Index	24.3	27.0	29.8	31.6	33.1	34.3	34.9	35.3
Dependency Index I (Youth dependency ratio)	55.7	55.4	51.5	49.0	46.2	43.6	40.9	38.7
Dependency Index II (Old dependency ratio)	13.5	15.0	15.4	15.5	15.3	14.9	14.3	13.7
Economic Burden Index	69.2	70.4	66.8	64.5	61.5	58.5	55.2	52.4

Source: own calculations based on data from the State Statistical Committee of the Republic of Azerbaijan

Ever since there is a theory of the demographic transition, according to which every country will undergo (or is undergoing) this transition in the population reproduction, thereafter general "laws" could be revealed. Improvements in health-care system associated with other achievements in socio-economic life lead to decrease in mortality rates, especially among infants, and positive contribution to life expectancy increase; at the same time fertility starts to decline as well. These in turn give rise to foreseeable population aging. It is also obvious that a combination of low mortality and fertility rates will eventually cause increase in working age population for some period of time. Taking into account that at first population growth is faster than the growth of the working age population, it might be observed that the demographic transition lead to "demographic burden". Soon after fertility decline, the transition leads to a so-called "demographic dividend" because the growth of the working age population is faster than the growth of the total population (Bloom et al., 2003). According to Mason (2005), in this context growth of the working age population is also supported by lower mortality. On the other hand, it also needs to be kept in mind that in such conditions of further fertility and mortality decline (certainly within reasonable natural limits) a "demographic burden" is coming in the stead of a "demographic dividend" again.

In other words, time when the population aging is not accelerated and fallen fertility has not turned into disaster yet is the best time for having a "demographic dividend". Assuming that policies in a country adapted to the situation of labour surplus and take advantage of this a large proportion of population in working ages can produce a "demographic dividend" of economic growth. "In fact, the combined effect of this large working-age population and health, family, labor, financial, and human capital policies can create virtuous cycles of wealth creation" (Bloom, 2001, p. 2).

Following these ideas and returning to the situation in Azerbaijan several conclusions is drawn. Using the comparison with 1990 it is seen from table 3 that young population of the country is gradually decreasing and for the beginning of 2009 it has constituted 16 per cent. Consequently, this will imply in the future size of working age population and decades later to retirement age population.

An upward trend of working age population has been sustained over the whole observed period 1990-2008 and in comparison with 1990 it rised by 42 per cent. At the same time, it

should be noted that in 1960-1970 labour force was growing annually by 23 per cent in average, in 1970-1980 – by 46 per cent, in 1980-1990 – by 16 per cent and in the period 1990-2005 – only by 1.6 per cent (M.Mammadova et al., 2007). In other words, over the period 1990-2005 average annual growth rate of the labour force by 11.9 times decreased in comparison with the period 1960-1970, by 23.9 times – in comparison with 1970-1980, by 8.3 times – in comparison 1980-1990 (M.Mammadova et al., 2007). Since an issue of the labour force is touched, it should be mentioned that the youngest in the labour force 15-24 age group has the lowest labour force participation rates. Being involved in vocational and high education, people at these ages mostly focused on accumulation of their knowledge and skills. Moreover, development of modern technologies needs high skilled workers; this in turn waits on much effort to be better prepared to meet requirements as well as to meet the competition on the labour market.

It is noteworthy, that while the working age population is increasing and by 2008 it has increased by 42 per cent, share of people over 65 is increasing as well. However, share of population over 65 is growing more rapidly and comparing with 1990 it has increased by almost 73 per cent. Within the same period a slight decline (by 23 per cent) in the proportion of people at the 60-64 age group is observed. Consequently, it might be assumed that for some period it will slow down aging process to some extent.

Hence, observed nowadays an upward trend in the size of working age population coupled with the decline in youth and old-age dependency ratios creates an enabling environment for producing the “demographic dividend” of economic growth. In the course of time as the high proportion of today’s working age population will be aging and retiring, and smaller cohorts of young adults will be entering the labour market, “demographic burden” will be felt.

Chapter 4

Past and future of the population development components

4.1 Fertility

As it was already mentioned earlier, the population development of the country conditionally was divided into several periods. With regard to changes in birth rates, they started to appear since 1961. Thus, according to statistics, upward trend of birth rates since World War II reached its maximum of 42.6 births per 1000 by 1960. Afterwards, smaller cohorts of women born in the days of World War II reached their reproductive ages and caused a steady decline of birth rates. Since this period a declining trend ob births rates had started. As a consequence, over the period 1960-2008 birth rates decreased by 59 per cent and in 2008 constituted 17.6 births per 1000. Within this period a steady decline reached its minimum of 13.6 births per 1000 in 2002, whereupon birth rates started to increase again (to follow mentioned trends see fig. 3).

Ever since in 1990 Azerbaijan Republic gained its independence, significant changes occurred in the country and people's lifestyles. Started from the collapse of the USSR, instability and recession during the transition period, aggravated by effects and consequences of the occupation of 20 per cent of the country by Armenia, population of Azerbaijan Republic faced new conditions of life. The situation in the country started to stabilize since 1995 and consequently led to some improvement in the social-economic development. It is obvious, that over the last two decades occurred changes covered all spheres of life and influenced on population reproductive behavior as well (tab. 4).

Tab. 4 – Natality and fertility, Azerbaijan, 1990-2008

	1990	**1995**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Live births											
Males	94 385	75 105	62 590	59 495	59 742	61 299	71 009	76 180	80 237	82 005	81 808
Females	88 604	68 210	54 404	50 861	50 973	52 168	60 600	65 721	68 709	69 958	70 278
Total	82 989	43 315	16 994	10 356	10 715	13 467	31 609	41 901	48 946	51 963	52 086
Sex ratio at birth	107	110	115	117	117	118	117	116	117	117	116

Crude birth rate	25.5	26.4	24.8	23.5	21.2	18.7	16.7	16.9	15.7	14.8	14.6
General fertility rate	101.4	96.7	101.8	106.0	104.0	102.9	101.8	99.4	101.8	95.3	90.1
Total fertility rate	2.71	2.19	1.70	1.59	1.58	1.59	1.82	1.92	1.97	1.97	1.94
Gross Reproduction Rate	1.31	1.04	0.79	0.73	0.73	0.73	0.84	0.89	0.91	0.91	0.89
Net Reproduction Rate	1.25	0.99	0.76	0.71	0.70	0.71	0.82	0.87	0.89	0.89	0.87
Mean age of mothers at childbearing	26.9	25.9	26.5	26.4	26.3	26.2	26.3	26.2	26.1	26.0	26.0

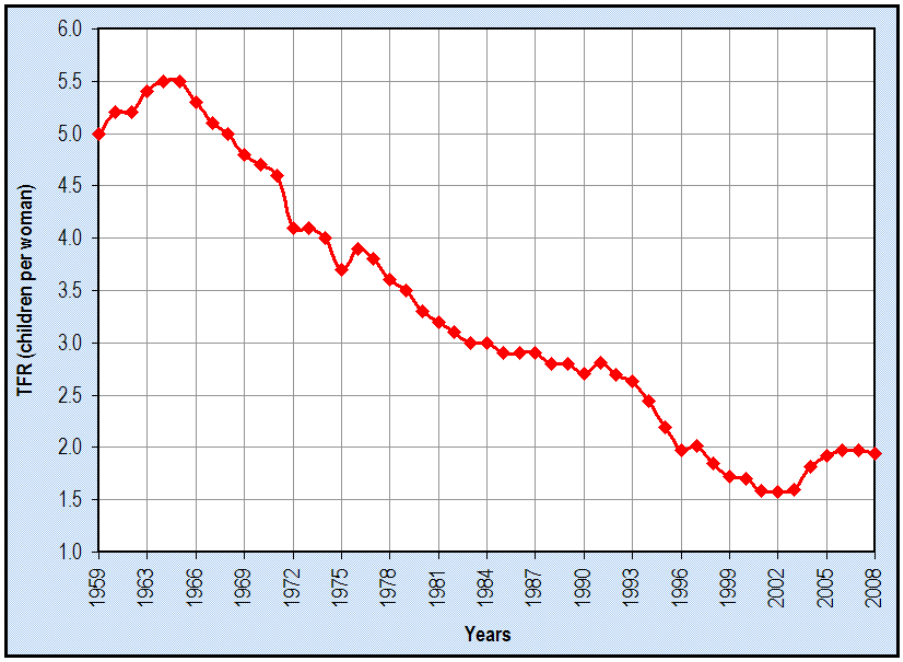
Source: own calculations based on data from the State Statistical Committee of the Republic of Azerbaijan

It becomes more apparent that started to occur in the developed countries changes in reproductive behaviour are likely to spread over the whole world. For instance, according to UN sources, the total fertility rate of the developing world dropped from 6.0 births per woman in the late 1960s to 2.9 in 2000-2005 (UN, 2007). The pace of such changes differs among regions; the substantial fertility decline is observed in Asian countries while the Sub-Saharan region is seen little change in reproductive behaviour. Noteworthy, countries where social and economic development was relatively rapid had experienced more rapid fertility declines as well. It is assumed, that the fertility levels of countries that are in transition will continue their decline until fertility drops slightly below the replacement level (UN, 2007).

As argued by Bongaarts, during the transition from high to lower fertility schedules "three key features are evident: 1) fertility is high until the transition begins; 2) once the transition gets underway fertility declines fairly rapidly and tends to continue doing so; 3) the pace of decline decelerates as countries reach the later stages of the transition" (Bongaarts, 2002, p.289). Moreover, one of the most important evidences is that the pace of fertility changes is positively associated with the level of fertility: the lower the TFR, the slower the pace of change. For example, before 1975 the average annual pace was 0.15 for countries with a TFR between 4 and 6, but then the pace was only 0.04 for countries with a TFR between 2.0 and 2.5 (Bongaarts, 2002).

Observing development trends of the total fertility rate in Azerbaijan (fig. 5), it should be noted, that during the Soviet period, long ago in the early 1960s, Azerbaijan was among countries with the highest fertility rates in the former Soviet Union. High fertility rates were explained by relatively low female mobility, low educational levels among women, early marriages and a tradition to have many children in families. However, over the last decades fertility rates significantly fell down and, as a consequence, over the period 1990-2008 the total fertility rate was deviating between 2.71 in 1990 to 1.58 in 2002 and to 1.94 children per woman in 2008 (tab. 4 and fig. 5).

Fig. 5 – Total fertility rate, Azerbaijan, 1959-2008



Source: 1959-1989 – State Statistical Committee of the Republic of Azerbaijan,
1990-2008 – own calculations based on data from the SSC of the Republic of Azerbaijan

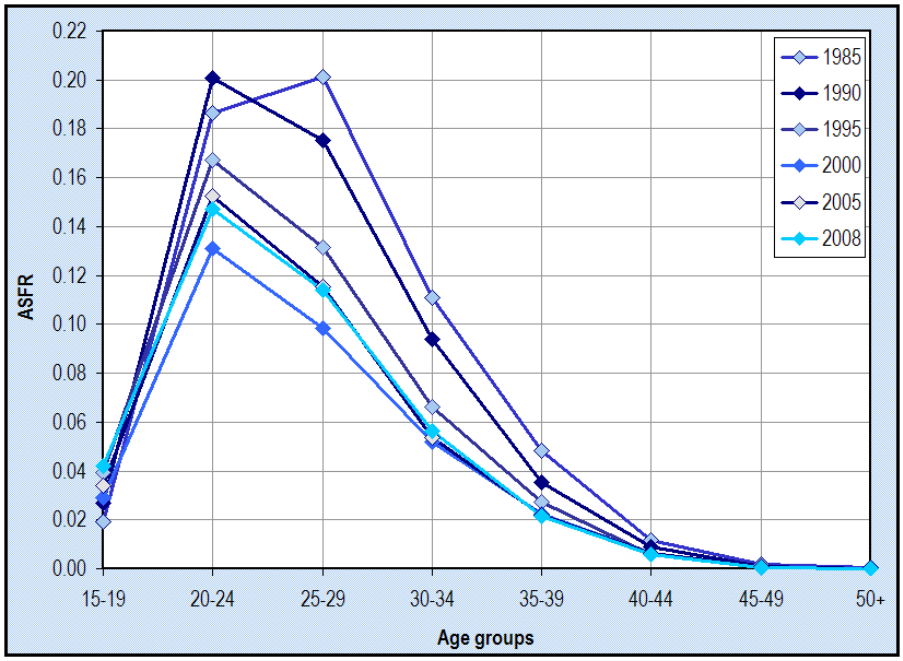
A steady decline from high fertility rates started to appear in the middle of 1960s. This downward trend with further tendency to stabilization at the level enough to population reproduction reflects a gradual transition to controlled fertility and family planning, especially among those groups of population which considered it unnecessary before. Accelerated in the 1990s fall of fertility intensities is a reaction of families and population in general on deterioration of social and economic situation and decrease of well-being the country inhabitants. Moreover, a gradual spreading of fertility regulation patterns and modern methods of contraception influenced on the fertility decline. Postponement of childbearing coupled with changes in family formation revealed in fewer numbers of children in families. Reduced number of marriages in the period of 1990s also implied the family formation and consequently affected on fertility towards its decline. At the same time industrialization and urbanization processes played an important role and contributed to the growth of labour force participation rates, which eventually lead to decrease of birthrate.

Generally, interpretation of fertility changes can be given by means of wide scope of factors influencing on family formation and parenthood: "**general factors**: 1) increased female education and female economic autonomy; 2) rising and high consumption aspirations that created the need for a second income in households and equally fostered female labour force participation; 3) increased investments in career developments by both sexes, in tandem with increased competition in the workplace; 4) rising 'post-materialist' traits such as self-actualisation, ethical autonomy, freedom of choice and tolerance for the non-conventional; 5) a greater stress on the quality of life with a rising taste for leisure; 6) a retreat from irreversible commitments and a desire for maintaining an "open future"; 7) rising probabilities of separation and divorce, and hence a more cautious 'investment in identity' and **country-specific factors**: 1) the geographical mobility of young adults in tertiary education; 2) lack or availability of state

subsidies for students in the forms of fellowships, housing facilities and transportation subsidies; 3) the flexibility of the labour market, including the possibilities for part-time work; 4) youth unemployment; 5) minimum income guarantees; 6) costs and availability of housing, both for "starters" and for households in later stages of family formation (often linked to the structure of labour market and its regulations); 7) contraceptive availability and methods mix; access to abortion" (Lesthaeghe, 2001).

Going into details, it is necessary to consider the total fertility rate as summarized and generalized characteristics of age-specific fertility rates. A diverse combination of factors affects on the general trend, but being under influence of the same factors, age-specific patterns may not follow this trend or may diverge from it to some extent. Thus, the total fertility rate represent overall picture of trends while age-specific patterns have own specific features of their reproductive behaviour and estimation of them is a highly useful auxiliary in the study of development of general fertility paths. Presented below figure illustrates changes in age profiles of fertility in the country over the period 1985-2008. Analysis of fertility patterns by age in the country reveals that childbearing tends to be concentrated in a woman's life mostly occurring between age 20 and 35 (fig. 6 and 7). The fertility rates are relatively higher in the 20-29 age group. Above mentioned decline in the general fertility pattern is observed in all age groups of mothers with the exception of 15-19 age group.

Fig. 6 – Fertility by age, Azerbaijan, selected years

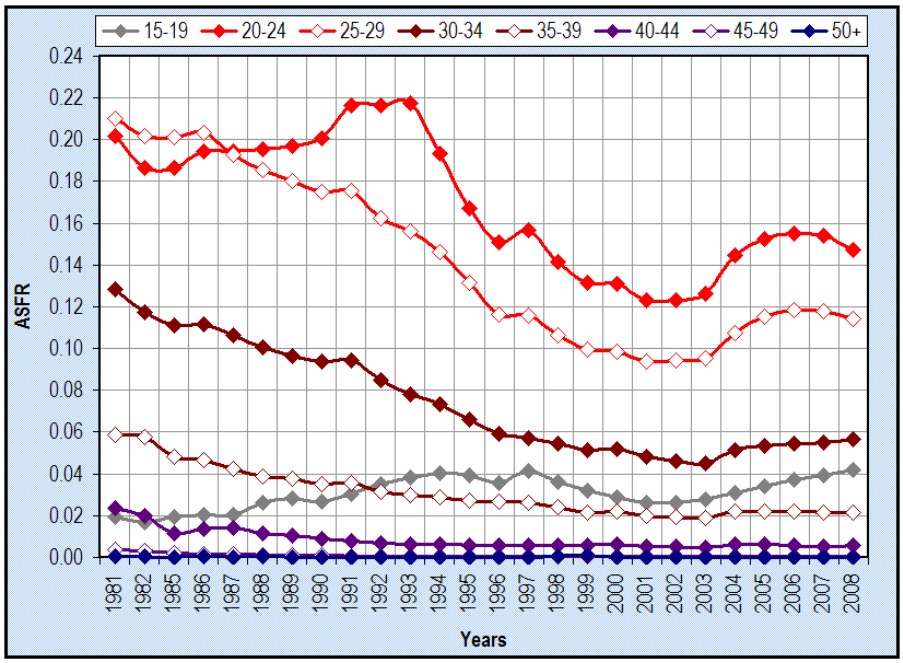


Source: own calculations based on data from the State Statistical Committee of the Republic of Azerbaijan

During the period 1990-2008 the fertility rate in this age group has risen up by 57 per cent and mainly due to higher fertility in rural areas. Compared to 1990, in 2008 the share of live births born by mothers aged 15-19 has increased from 5 to 12 per cent in the whole structure of births. Indicated in table 4 slight decrease in the mean age of mothers at childbearing in addition to other factors is apparently contributed by the mentioned fertility rise among women until 20. Despite this impact, the mean age of mothers is primarily influenced by the decrease of high-

order births. The increasing proportion of births at the youngest age group of 15-19 is likely to be related and influenced by a surge (since 2003) of extramarital fertility. However, it is worth to note, that most of out of wedlock live births is recorded in the register for acts of civil status by mutual declaration of parents (between 2003 and 2008 the number varies between 86 and 74 per cent of total births) and according to estimations they are in fact children born in marriages accepted by religion (church marriages).

Fig. 7 – Development of fertility by age, Azerbaijan, 1981-2008



Source: own calculations based on data from the State Statistical Committee of the Republic of Azerbaijan

Evaluating changes of the other age-specific fertility rates, values it is seen that in contrast to the increase of the values in the youngest age group the remaining and most part of females at reproductive ages is characterized by a fertility decline in the period 1981-2008. Appeared since 2002 a simultaneous rise in age-specific fertility rates is likely to be influenced by improvements in population well-being which encouraged people to realize their parental aspirations. The upward trend was also supported by births postponed from previous years until better times. However, it seems impossible to return to the fertility level of 1980-1990. All benefits from the observed economic growth and social development in the county can temporarily stimulate women to bear children, but in a long perspective lead to changes in individual life values and influence through a wide range of factors on reproductive behaviour of potential parents.

Overall, the most significant decrease of fertility rates between 1981 and 2008 which occurred in the 25-34 age group can be explained by the fact that the country moves through the fertility transition which is expressed as a tendency to fewer number of children per woman. As it was noted by Bongaarts (1999), in contemporary societies with fertility around 2 births per woman, most women have at least one birth as was the case historically, but the proportion of women with higher-order births is much smaller than in the past. In fact, fertility declines might be observed at all birth orders, but they are far larger at higher than at lower orders.

Tab. 5 – Live births by birth order, Azerbaijan, 1995-2008

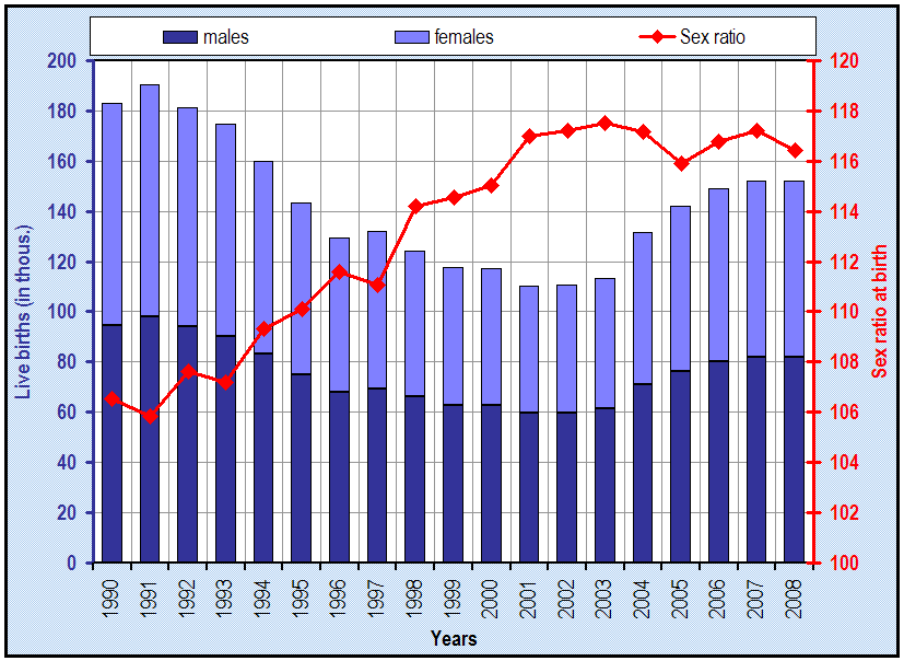
Birth order	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008
Number of live births										
1st	54 830	49 551	49 638	49 794	54 997	67 106	76 302	82437	82 576	83 346
2nd	47 492	38 256	35 806	36 311	36 037	42 466	44 414	46 233	49 195	48 199
3rd	25 882	20 098	17 456	17 793	16 578	16 317	16 034	15 936	16 259	16 769
4th	9 817	6 149	5 194	4 802	4 210	4 280	3 866	3 394	3 071	3 037
5th and more	5 294	2 940	2 262	2 015	1 645	1 440	1 285	946	862	735
Total	143 315	116 994	110 356	110 715	113 467	131 609	141 901	148 946	151 963	152 086
Proportion (in per cent)										
1st	38.3	42.4	45.0	45.0	48.5	51.0	53.8	55.3	54.3	54.8
2nd	33.1	32.7	32.4	32.8	31.8	32.3	31.3	31.0	32.4	31.7
3rd	18.1	17.2	15.8	16.1	14.6	12.4	11.3	10.7	10.7	11.0
4th	6.8	5.3	4.7	4.3	3.7	3.3	2.7	2.3	2.0	2.0
5th and more	3.7	2.5	2.0	1.8	1.4	1.1	0.9	0.6	0.6	0.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: State Statistical Committee of the Republic of Azerbaijan

As it is seen from the table, over the period 1995-2008 a proportion of children of the third and higher order was permanently declining and recently the trend can be characterized by stabilization. Coupled with increase of the first order births and approximately constant proportion of children of the second order it can be interpreted as a transition to smaller in size families. Evolution of family values, transformation of types and social functions of family is caused by changes in the social development. Undoubtedly, being involved in the dynamic development of the country, people start to aberrate from the past reproductive behaviour and family patterns. People aspire to meet constantly growing requirements of labour market and career development, social and cultural life.

Analysis of current fertility trends in the country will be incomplete without touching upon one of the most interesting facts about fertility in Azerbaijan. The curious fact is that contrary to biological rules, within last two decades sex ratio at birth in Azerbaijan rose up from 107 in 1990 to 116 in 2008. The discussion which has already started from the description of the population sex structure (chapter 3.2) requires more attention to the specific feature. Changes in the sex ratio at birth towards its increase significantly contribute to the perspective population development and underestimation of this indicator as well as kept at this level sex imbalance can lead to women deficit and problems with generational replacement. Presented below figure illustrates a number of live births by sex and the sex ratio at birth (fig. 8).

Fig. 8 – Live births and sex ratio at birth, Azerbaijan, 1990-2008



Source: State Statistical Committee of the Republic of Azerbaijan

It is seen from figure 8 that in conditions of relatively decreased absolute numbers of live born children an upward trend of sex ratio becomes more evident. Thus, the overall fall of birth rates to a large extent affects the increase of sex ratio in the country, and consequently as quick a downward fertility trend as high the sex ratio.

Broadly speaking, over decades the list of countries with raised sex ratio was leading by China, South Korea, India (north-west parts), followed by Taiwan, Hong-Cong, San-Marino, Albania. However, according to last estimations of recent trends Armenia, Azerbaijan and Georgia reached the highest levels of sex ratio at birth and became top-leaders in the world (www.cia.gov).

Obviously, occurrence of such uncommon high sex ratio at birth (or any other age) in the country requires some explanations. In this respect, examination of data quality – misreporting, misrecording, or underregistration of births or deaths might be a possible explanatory factor. However, review of the literature revealed a broad scope of alternative explanations. Widely discussed alternative explanations are: sex-selective abortions, infanticide, some biological aspects of fertility structure related to age, education and marital status of parents, birth order and intervals, environmental conditions, phenomena of military years.

This study does not claim to be exhaustive with regard to analysis of causes and provision of comprehensive explanations to the raised sex ratio at birth in Azerbaijan. Special surveys conducted in this field may shed light into this issue. Meantime, since this study is focused on evaluating current trends in the country and their impact on scenarios of future population development, an inverse relation between changes of fertility patterns in the context of socio-economic development with demand for boy preferences is used.

In fact, the superficial analysis allows assuming that increase in sex ratio at birth might be explained by a combination of at least three interrelated factors: a reduction in family sizes, the

desire for a son, and the spread of sex determination methods. So it seems that as family planning with focus on preferences for having a son becomes more common and since common pre-delivery sexing becomes easier to access, selective abortions become more widespread.

The impact of this phenomenon is already visible in the sex composition of children in schools and from year to year mentioned factor contributes to the population age-sex structure shifting this imbalance up in time. Moreover, undertaken efforts within the framework of the policy aimed on improvements of mortality situation in the county, including implementation of relevant measures towards a reduction of infant and children mortality is likely to have certain effects on the elimination of the sex imbalance. If the expectations are meant to be legitimate and will be achieved, due to higher mortality among men the progress in the survival probabilities will be more tangible for male population. Consequently, sex disproportions in these cohorts will be revealed through their life course and particularly at the age of union formation: girls, being outnumbered, will easily find a partner, while some boys will remain unpartnered (Pison, 2004).

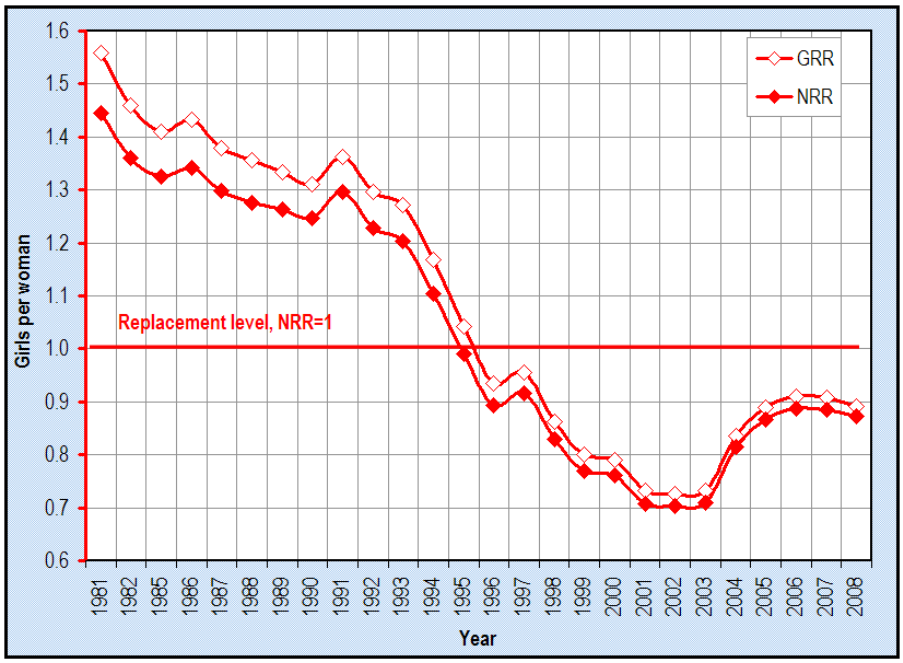
It is no less than natural, it should cause concerns in the country. It is worth to mention that alarming changes in the sex structure of population of Azerbaijan Republic have already caused debates over this issue on the governmental level. Elaborated and submitted to the Parliament a draft of the Law on reproductive health and family planning has been already discussed in November, 2009. It is assumed that adoption of the Law might provide a basis for implementation of necessary activities towards the prevention of selective abortions (to some extent through the control of prenatal sex determination).

Resorting to the experience of countries faced such problem of raised sex ratio it is seen that, for instance, "South Korean authorities have followed other countries by prohibiting foetal sex determination examinations and selective abortion; severe penalties exist and have been imposed on offending doctors"(Kim, 2003). Despite the fact that in the early 1990s South Korea had one of the highest sex ratios in the world, by 2007 due to implemented measures it had been reduced to the level comparable with other countries.

This fact of raised sex ratio would not be so alarming if there were no consequences to the future population development. Significant negative impact of the sex ratio at birth is revealed in current trends of reproduction rates (fig. 9).

Important measures used to summarize reproduction level of the population are represented by the values of Gross Reproduction Rate (GRR) and Net Reproduction Rate (NRR). The GRR is the average number of daughters that would be born to a woman during her life time if she conformed to the age-specific fertility rates of a given year. The NRR is the average number of daughters born per woman if she passes through her lifetime from birth conforming to the age specific fertility and mortality rates of a given year. In contrast to GRR, the NRR takes into account that some women will die before completing their childbearing years. Observed from the figure a decrease in the difference between the GRR and NRR values means that mortality risks among females were permanently declining over the whole period.

Fig. 9 – Gross reproduction and net reproduction rates, Azerbaijan, 1981-2008



Source: own calculations based on data from the State Statistical Committee of the Republic of Azerbaijan

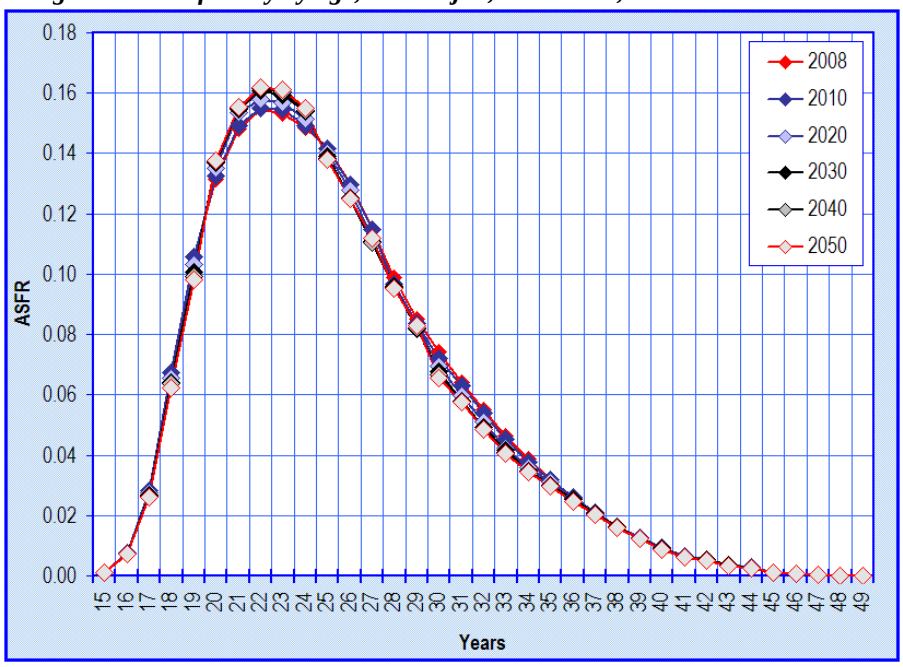
The GRR and NRR are similar to the TFR except that they measure only female births, since reproduction is largely dependent on the number of females in a given population. As it is generally known, if the NRR equals to 1 (one), then it complies with the requirements of the replacement level of generations. For the case when the NRR is larger than 1 (one), it means that a newlyborn girl will on average produce more than one daughter, and will replace more than herself. The populations with NRR values below 1.0 do not meet the requirement of the generational replacement and a long term insufficient fertility can lead to population decline. Consequently, it might be concluded that fertility level expressed through values of the NRR and GRR leads to more pessimistic prospective about future population development than in terms of the TFR in Azerbaijan.

It is fairly clear that without proper attention to this matter, Azerbaijan will eventually face unprecedented demographic problems of sex disproportions and women shortage. It should be noted that not only adoption of the above mentioned law on reproductive health and family planning but also determination of necessary measures and their efficient implementation would be very timely. The component of the sex ratio at birth was also included in the fertility forecasting model with assumption that it will be raising in case of fertility decline in low variant, slightly decreased from the current level for the medium and is set to be the lowest for the high variant.

Nowadays it seems very unlikely to return to past high fertility rates. Undoubtedly, being involved in the dynamic development of the country, people start to aberrate from the past reproductive behaviour and past family patterns. People aspire to meet constantly growing requirements of labour market and career development, social and cultural life. Hence, predominant tendency in the society to bear children in younger ages causes conjectures that

future changes may reflect slight shifts in the age groups, but it is likely to deviate slightly within boundaries of 15-35 age group with higher concentration in the group of 20-29.

Fig. 10 – Total fertility by age, Azerbaijan, 2008-2050, medium variant



4.2 Mortality

Over the period after World War II the development of mortality in Azerbaijan was characterized by relatively stable crude death rates at about 7 per mile. Basically, within this period just once mortality rates raced up – in the early 1990s (fig. 3). After restoration of state independence in 1990 a wide range of social and economic problems affected everyday life of almost every inhabitant. It was supplemented by a situation related to military actions in Nagorno Karabakh and the occupation of a significant part of the country by Armenia. It is no wonder, that deaths, which were, in fact, mostly losses and victims of the war, increased the overall mortality level and particularly mortality in the exposed age groups of young men.

Nevertheless, the major trends in mortality developments were not changed regardless temporary deviations during the 1990s. The principal decline of mortality observed in the second half of the 20th century was predominantly influenced by improvements in medicine and public health, including the introduction of antibiotics and other new effective treatments, and widened preventive measures. This decline was also accompanied by improved sanitation and extending practice of healthier behaviors (Bloom et al., 2001). Following the epidemiologic transition, the mortality decline occurred firstly due to reducing numbers of deaths from infectious and parasitic diseases (Omran, 1971). As these causes affected on young population, over time mentioned factors gradually implied a change from a regime of high infant and child mortality to lower rates and led to gains in life expectancy.

More recent period 1981-2008 was characterized by slight steady decline of mortality rates. Crude death rate value decreased from 6.9 to 6.0 deaths per 1000 inhabitants which is very similar to decline of analogous standardized rate values from 10.6 to 9.5 deaths between 1981

and 1990 (tab. 6). It illustrates that the first years of independent Azerbaijan passed in the population history by aggravated demographic indicators. However, the subsequently achieved political stability initiated economic growth and consequently led to improvements in demographic situation. Mortality rates began to revert to previous levels after 1993. This year is associated with the highest level of mortality in the period of observation measured through standardized crude death rates. Between 1993 and 2008 the fall of mortality from 7.0 to 6.1 deaths per 1000 inhabitants or recalculated using the Old European Standard (WHO) age structure from 11.1 to 9.5 deaths.

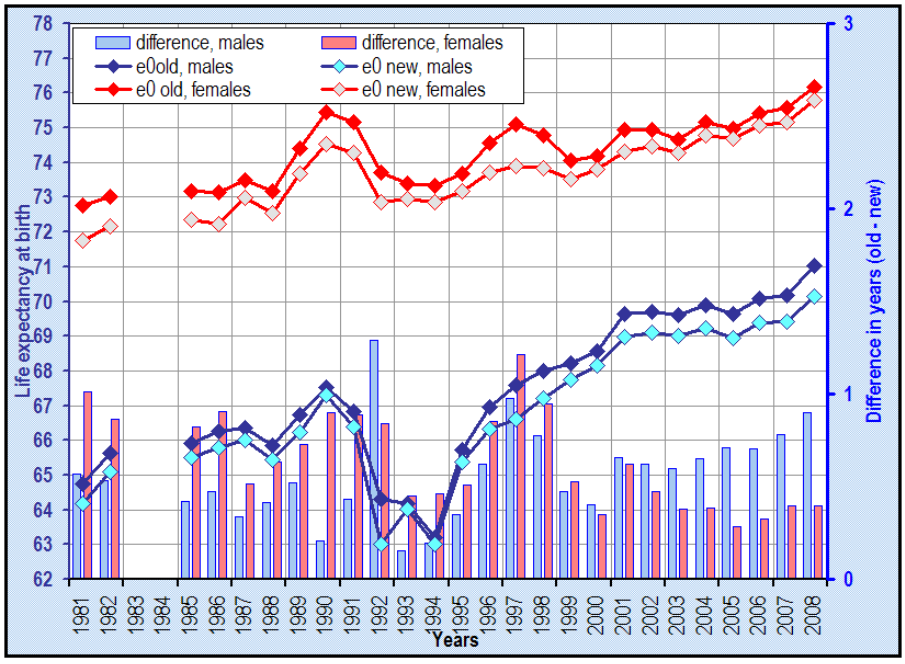
Tab. 6 –Developments of mortality, Azerbaijan, 1981-2008

	1981	**1985**	**1990**	**1993**	**1995**	**2000**	**2005**	**2006**	**2007**	**2008**
Number of deaths	42 898	45 179	42 819	52 809	50 828	46 701	51 962	52 248	53 655	52 710
Crude death rate (per 100 inh.)	6.9	6.8	6.0	7.0	6.6	5.8	6.2	6.2	6.3	6.1
Standardized death rate** (per 100 inh.)	10.6	10.6	9.5	11.1	10.8	10.4	10.3	10.0	9.9	9.5
	Life expectancy at birth* (in years)									
males	64.18	65.49	67.31	64.03	65.37	68.15	68.93	69.38	69.40	70.13
females	71.75	72.35	74.54	72.94	73.16	73.82	74.70	75.08	75.17	75.78
	Life expectancy at the exact age 65* (in years)									
males	12.70	12.42	14.29	13.24	12.96	13.26	13.03	13.09	13.13	13.37
females	16.46	15.93	17.29	16.52	16.45	15.63	15.42	15.45	15.48	15.88

Source: State Statistical Committee of the Republic of Azerbaijan
Note: * - own calculations
** - The Old European Standard (WHO)

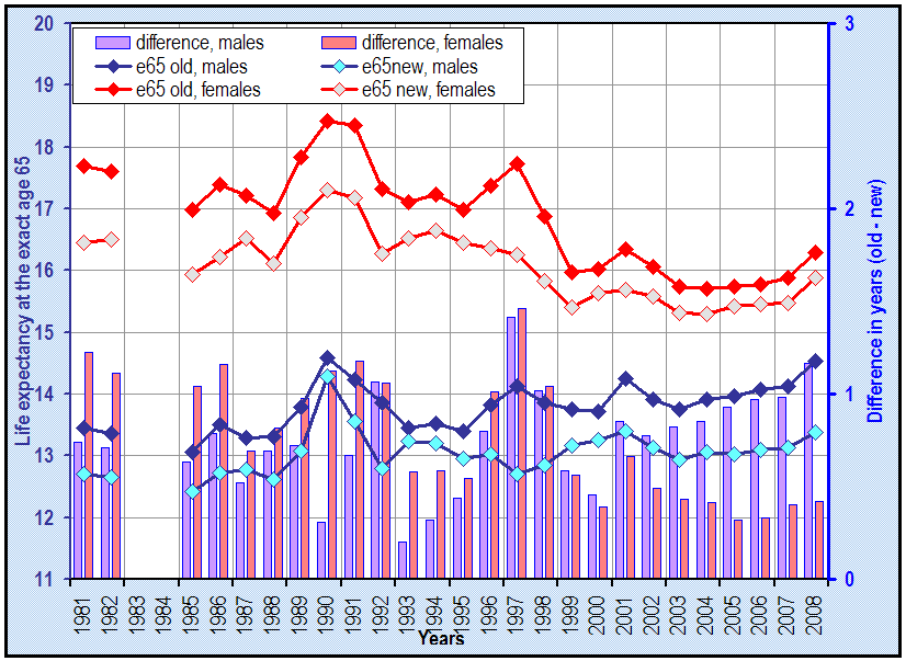
Reflected in the development of life expectancy at birth changes to a certain extent illustrate the general improvements in the field of mortality. However, in the course of the discussion about mortality changes it should be stressed, that assessment of data on accuracy in the first stages of analysis has revealed an overestimation of values of the life expectancy as well as other mortality indicators, particularly in high ages. The discovered irregularities were eliminated and the adjusted values were used in the basic analysis and the following stages of the forecasting process. Presented below figures (fig. 11, 12 and 13) illustrate obtained results expressed in terms of values of life expectancy at birth, at the exact age 65 and 85 for both sexes. Difference between "old" (empirical) and "new" (adjusted) values of life expectancy is much visible for the exact ages 65 and 85 which implies the fact of underestimation of mortality rates for these ages.

Fig. 11 – Life expectancy at birth, Azerbaijan, 1981-2008



Note: *Old* – refers to the values before adjustment and *New* – after adjustment
Source: own calculations

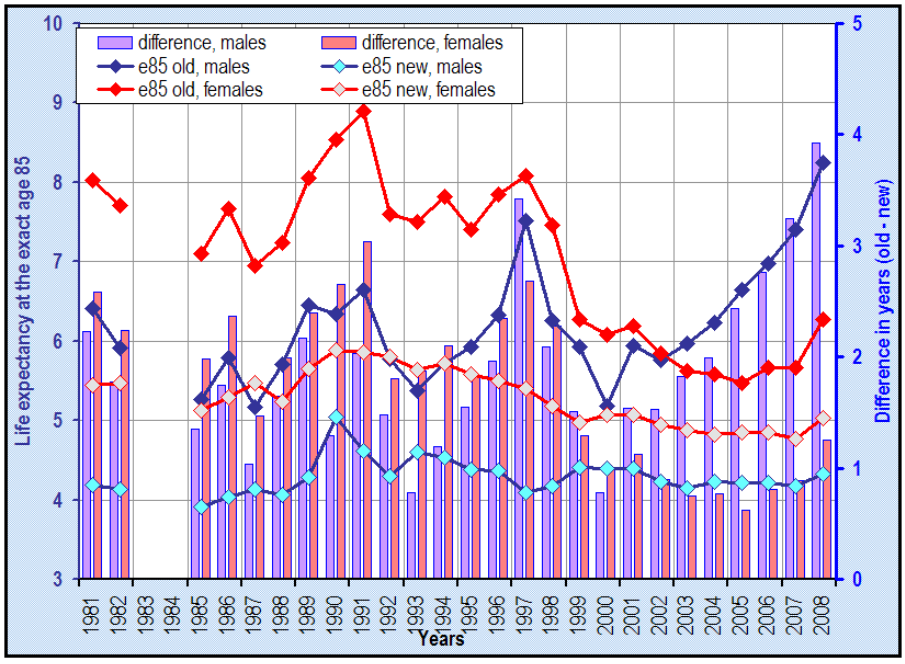
Fig. 12 – Life expectancy at the exact age 65, Azerbaijan, 1981-2008



Note: *Old* – refers to the values before adjustment and *New* – after adjustment
Source: own calculations

Thus, as it is seen from the above presented table 6 and figures 10, 11, 12 between 1981 and 2008 the life expectancy at birth was gradually growing until 1990, and then in 1990-1993 it dropped from 74.5 to 72.9 years for females and from 67.3 to 64.0 years for males. As it was noted earlier, the unfavorable socio-economic and political situation in the country resulted in mortality rates increase and corresponding drop of life expectancy values.

Fig. 13 – Life expectancy at the exact age 85, Azerbaijan, 1981-2008



Note: *Old* – refers to the values before adjustment and *New* – after adjustment
Source: own calculations

Later on, stabilization of the situation and development of all spheres of life since 1995 had an impact on a mortality decrease as well. As a result, life expectancy reached 75.7 and 70.1 years for females and males respectively. Thus, within the period 1981-2008, the indicator raced up by 4 years (from 71.7 to 75.7) for females and by 6 years (from 64.1 to 70.1) for males. However, improvements in mortality expressed through comparative indexes of probabilities of dying do not show reduction of mortality risks among all age groups both in 1981-2008 and 1990-2008 (tab. 7).

Tab. 7– Mortality by age groups, Azerbaijan, 1981, 1990 and 2008

Age groups	Probability of dying (x 1000)						Comparative Index			
	Males			Females			2008/1981 (per cent)		2008/1990 (per cent)	
	1981	1990	2008	1981	1990	2008	Males	Females	Males	Females
0	38	25	11	31	21	11	30	36	46	54
1-4	29	19	4	26	17	3	13	12	19	18
5-9	6	4	3	4	3	2	48	42	69	55
10-14	3	2	2	2	1	1	63	73	93	97
15-19	4	4	3	3	2	2	82	67	82	90
20-24	6	6	4	3	3	2	72	66	66	83
25-29	8	9	6	5	4	3	72	58	71	70
30-34	12	11	9	6	5	3	80	60	83	72
35-39	17	15	11	9	6	5	66	59	74	87
40-44	27	25	18	12	9	7	67	59	74	77
45-49	37	37	27	18	15	12	74	68	73	79
50-54	62	55	44	28	26	21	72	74	81	80
55-59	95	90	77	41	41	36	81	88	85	88

60-64	131	118	111	64	61	61	84	95	94	101
65-69	183	157	162	101	93	103	88	102	103	111
70-74	262	217	240	160	145	170	92	106	110	118
75-79	374	307	352	250	226	271	94	109	115	120
80-84	515	429	495	377	343	410	96	109	115	120

Source: own calculations

Development of probabilities of dying indicates the most significant changes in mortality among infants and children. Over the period 1981-2008 infant mortality dropped from 38 deaths to 11 deaths per 1000 among boys and from 31 to 11 – among girls. It should be noted, that the greatest extent of the positive downward trend is a decrease of deaths caused by infectious and parasitic diseases. Improved medical technologies, access to them and better lifestyles contribute to mortality reduction from such diseases (Omran, 1971; Olshansky and Ault, 1986). In all structure of main causes of infant deaths the diseases of respiratory system constitute main share (32.4 per cent in 2008). The next numerous group are deaths from certain conditions originating in perinatal period (20.3 per cent in 2008) and congenital anomalies (developmental defects) (18.5 per cent in 2008).

Tab. 8 – Infant mortality by main causes of death, Azerbaijan, 1990-2008

Main causes	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008
	Deaths per 10.000 live births										
All causes	**230**	**233**	**164**	**166**	**167**	**155**	**145**	**127**	**119**	**121**	**114**
Diseases of respiratory system	110	115	82	85	85	75	72	66	54	49	42
Certain conditions originating in perinatal period	35	37	33	28	25	27	25	21	22	22	22
Congential anomalies (developmental defects)	16	12	8	10	13	14	13	11	17	21	19
Some infectious and parasitic diseases	50	37	19	18	20	17	14	11	9	10	8
Diseases of the nervous system	5	14	13	14	13	13	9	5	5	6	9
Injuries, poisoning and some other results of impact of external reasons	3	4	3	2	2	2	2	2	2	2	1
Digestive disorders	1	1	0	1	1	2	2	2	2	2	2
Symptoms, indications and inadequate conditions specified in clinic and laboratory examinations not classified in other section	10	14	7	8	8	7	8	9	8	10	12

Development index (1990=100)											
All causes	**100.0**	**82.9**	**45.2**	**45.0**	**43.3**	**39.3**	**45.1**	**37.7**	**44.9**	**41.9**	**40.9**
Diseases of respiratory system	100.0	85.5	48.7	47.9	45.8	38.0	49.5	40.2	38.1	35.4	27.6
Certain conditions originating in perinatal period	100.0	85.5	53.7	45.1	41.7	51.9	44.0	46.8	51.8	49.9	54.3
Congential anomalies (developmental defects)	100.0	58.5	32.3	47.3	51.0	52.0	57.8	46.9	125.5	91.8	107.8
Some infectious and parasitic diseases	100.0	60.9	21.9	24.2	24.4	16.9	20.3	13.7	16.9	15.3	10.9
Diseases of the nervous system	100.0	244.2	186.0	169.8	161.6	172.1	82.6	65.1	86.0	108.1	198.8
Injuries, poisoning and some other results of impact of external reasons	100.0	96.6	55.2	32.8	25.9	34.5	51.7	50.0	63.8	44.8	25.9
Digestive disorders	100.0	63.6	4.5	72.7	59.1	100.0	122.7	109.1	127.3	109.1	95.5
Symptoms, indications and inadequate conditions specified in clinic and laboratory examinations not classified in other section	100.0	116.2	48.6	53.1	50.3	31.8	74.3	55.9	68.7	96.1	105.6

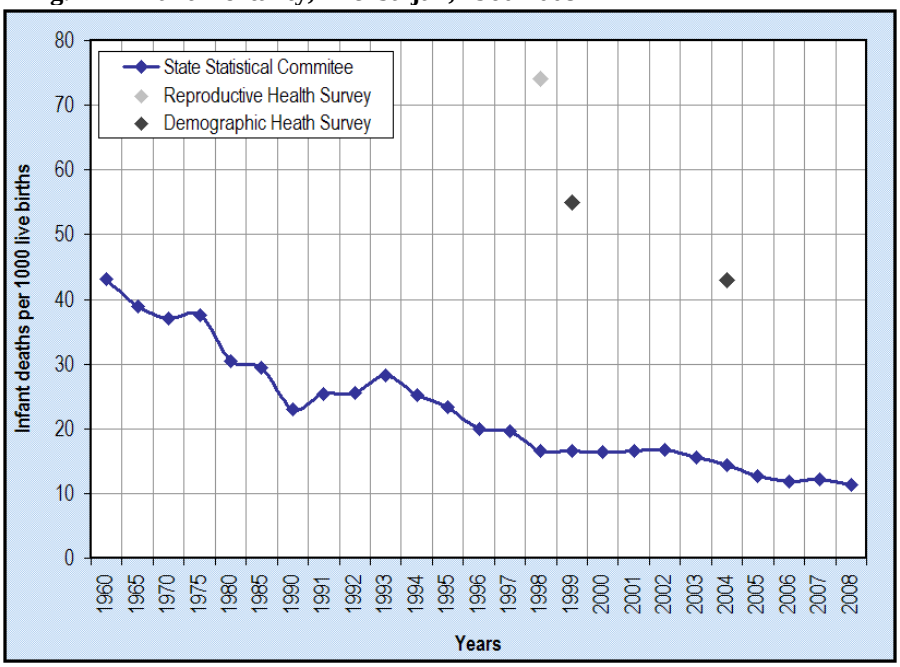
Source: State Statistical Committee of the Republic of Azerbaijan

"According to official sources, some 44 per cent of all infant deaths occur within the first month of life, of which 91 per cent occur within the first week after delivery. Most of these deaths are completely preventable and happen because of outdated care practices among health professionals, lack of vital equipment in health care facilities, as well as limited awareness of mothers on health-related issues and lack of healthy behavior skills among population" (http://www.unicef.org) Moreover, it should be noted that data quality is the most problematic issue when considering perinatal mortality rates, because both stillbirths and early neonatal deaths are still susceptible to underreporting. The numbers may reflect underreporting of both stillbirths and early neonatal deaths among rural, less educated, and poorer women. According to the definition used in Azerbaijan deaths of fetuses with the sign of life starting from the 28th week of pregnancy till actual delivery, death at birth and during the first 168 hours (7 days) of life constitute perinatal deaths. Despite the fact that general perinatal mortality level is still high, owing to recent development in the field of infant, child and mother health the overall perinatal mortality rate is decreased from 13.1 in 1990 to 9.7 deaths per 1000 live births in 2008.

It the given context, it should be mentioned, that entire reliability of data on infant mortality remains fully under the question. The reason is that international surveys being conducted on the territory of the country show substantially higher rates of infant mortality in comparison

with numbers presented by the State Statistical Committee of the Republic of Azerbaijan. For instance, according to the Demographic and Health Survey (2006) the infant mortality rate was estimated at 43 deaths per 1000 live births, while the official statistics based on death registration reported only 14 deaths per 1000 live births for the same period. The departures of the results of previous similar surveys from the corresponding official data are fully comparable (fig. 14).

Fig. 14 –Infant mortality, Azerbaijan, 1960-2008



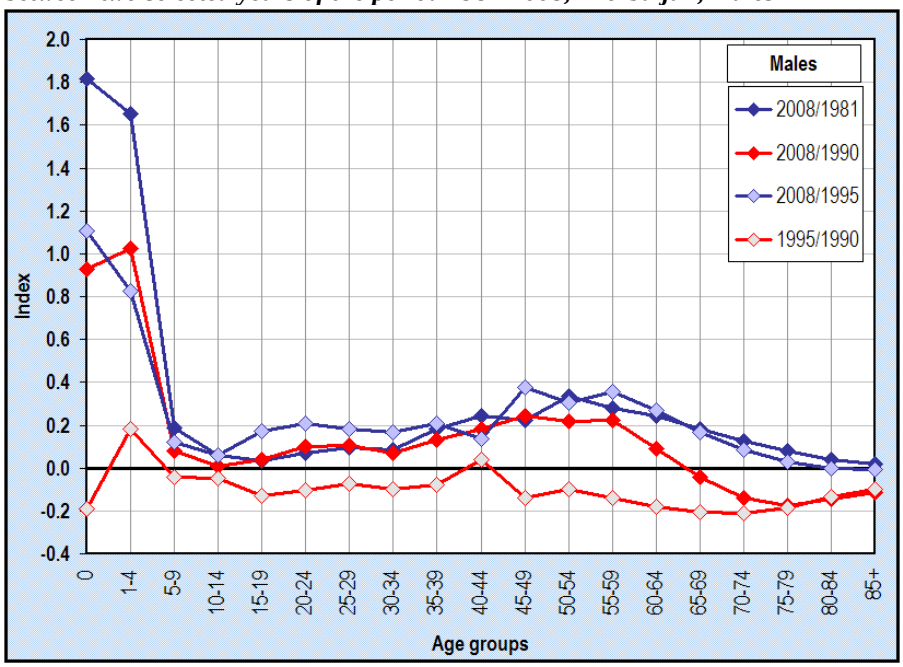
Source: SSC of the Republic of Azerbaijan and AzDHS, 2006

The differences in presented values of the infant mortality rates are explained by differences in the applied definitions of the child born alive. The recently conducted and presented surveys (Multiple Indicator Cluster Survey – 2000, Reproductive Health Survey – 2001, Demographic and Health Survey – 2006) were based on the World Health Organization definition, saying that any fetus showing signs of life at birth is considered to be a live birth. In contrast, all the data of the official Azerbaijani statistics are based on the old (or so called Soviet) definition of live births, which excluded from the calculation of the infant mortality rate infants being born after less than 28 weeks of gestation, weighing less than 1,000 grams, or having less than 35 centimeters in length and dying after the first seven days of life. Moreover, the quality of the survey responses is affected by a fact that some mothers may interpret the definitions used in surveys in a different (own) way, at least because the death of children is invariably painful for a mother to talk about.

Returning back on topic of development of mortality in different age groups (fig. 11-13) it should be mentioned that positive changes in mortality at working ages also contribute to general mortality decline and the total increase of life expectancy between 1981 and 2008 as well as in the period 1990-2008. The most visible improvements were achieved by 40-64 age groups during the period 1981-2008. At the same time there is an evidence of increasing probabilities of dying at older ages, over 65 years.

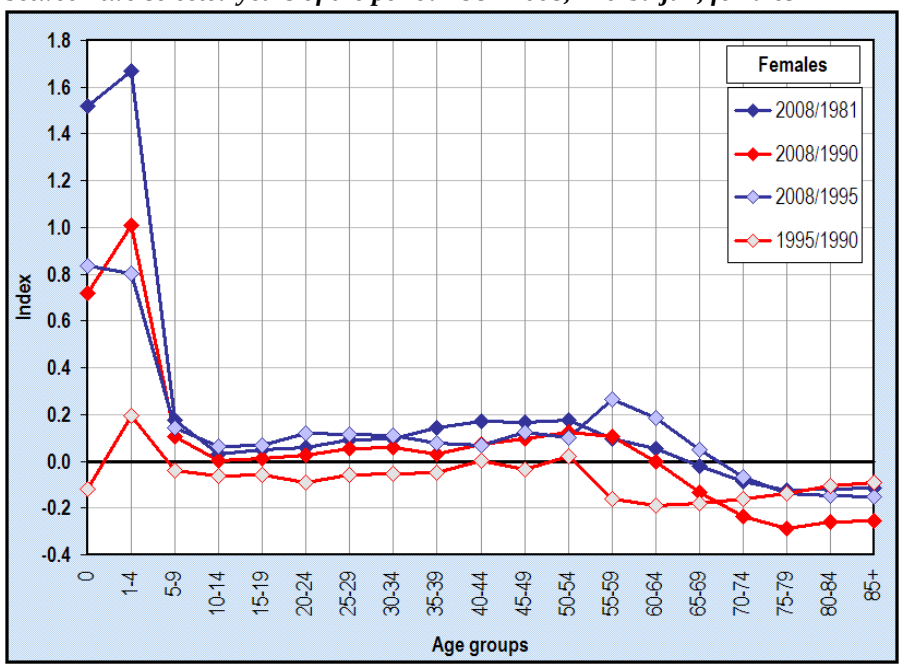
The changes in mortality rate values in different age groups have to a certain extent positive or negative effects on the life expectancy levels at ages below the corresponding level. Decomposing entire change of life expectancy at birth on contribution of particular age groups using widely applied Pollard's (1982) method of decomposition we can estimate the role of mortality change in each of these groups (fig.14 and 15).

Fig. 15– Contribution of age groups to the change of life expectancy at birth between two selected years of the period 1981-2008, Azerbaijan, males



Source: own calculations

Fig.16 – Contribution of age groups to the change of life expectancy at birth between two selected years of the period 1981-2008, Azerbaijan, females



Source: own calculations

Observed distribution of the age-specific mortality rates values and their changes revealed, that recent significant decrease of infant and child mortality levels positively contributed to the total mortality decline and, consequently, to the rise in life expectancy. It is, however, not the case of mortality at higher ages.

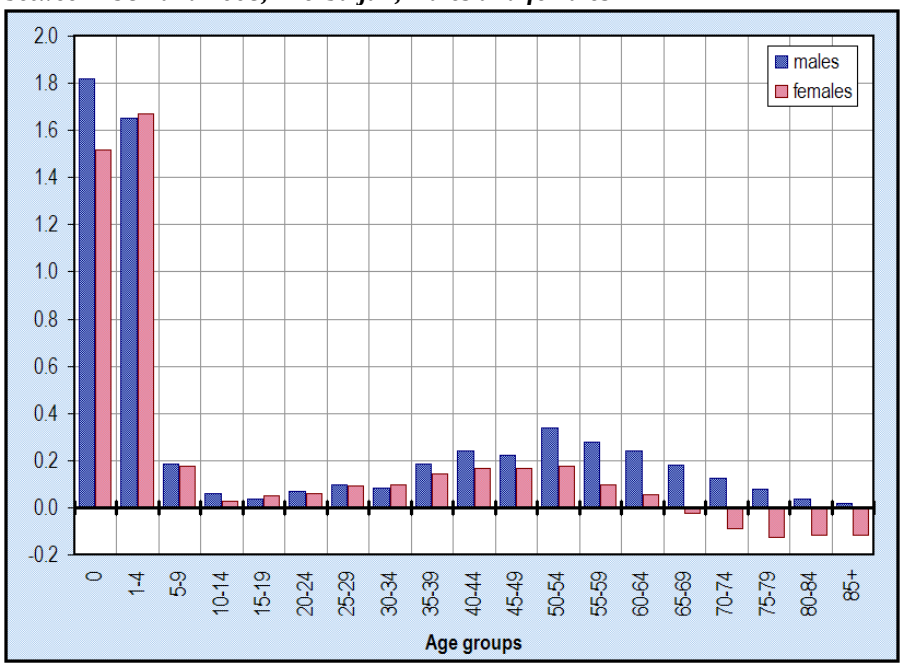
Political changes in the early 1990s induced large scale social and economic instabilities being presented by decline of the standards of living and quality of health services which resulted in temporary increase of the overall mortality level. Best visible it is in comparison of the years 1990 and 1995. Years between were not taken into account since mortality levels namely in the case of males, were influenced by the war conflict with Armenia. The resulting impact of the described changes on the overall mortality during this period is unambiguous and more or less regularly distributed over all age groups. Since the year 1995 the observed mortality developments more than eliminated the given increase of mortality through relatively stable increase of life expectancy at birth values for males and females as well. Currently (2008), the life expectancy at birth for males was 2.8 years higher than in 1990 and 4.8 years higher than in 1995. Analogically, overall female mortality decrease added to the life expectancy at birth about 1.3 years in comparison with the year 1990 and 2.5 when comparing the current mortality situation with those in the year 1995. Contributions of particular age groups to the described changes were obviously different. According to this criteria positively dominated developments of infant and child mortality, other groups contributions were substantially lower and in the sum even smaller than contribution of the first two youngest groups. In comparison with deeper history of the year 1981 in all age groups except females over 65 years of age we can observe some improvements of mortality situation (fig.17). Delegating the year 1990 into the role of reference year, the same phenomenon, i.e. increase of mortality of older persons (seniors) can be observed also for males over 65 years of age (fig.18).

Further mortality developments can therefore be seen in the close relation to the epidemiologic transition. The epidemiological transition theory describes general changes of the level and structure of mortality according to the most common particular causes of death and their groups in historical perspective. The first phase of this transition is characterized by high mortality from infectious and deficiency diseases. Better hygiene and higher standards of living led to a sharp reduction of mortality from these types of diseases. This change is called phase two and mainly affects children and young people. In phase three, the chronic diseases such as heart and lung diseases and cancer prevails and mortality is relatively stable, but at substantially low level than during the first phase. Since the 1970s, when the theory of epidemiological transition was first published, mortality from the chronic diseases has sharply decreased. This has led to the appearance of the fourth phase with a decrease in mortality from chronic diseases, i.e. namely among the elderly (Olshansky and Ault, 1986).

Referring to the current structure and developments of mortality during past decade one can state that Azerbaijan entered the third stage of epidemiological transition during the 1990s. Between 1995 and 2003 the intensity of mortality on infectious diseases in the country dropped by 50 per cent and within the following five years it decreased for other 30 per cent (tab. 9). On the other hand, slight increase or stagnation of mortality in the leading groups of the causes except respiratory diseases signalize that the shift to fourth stage of epidemiological transition

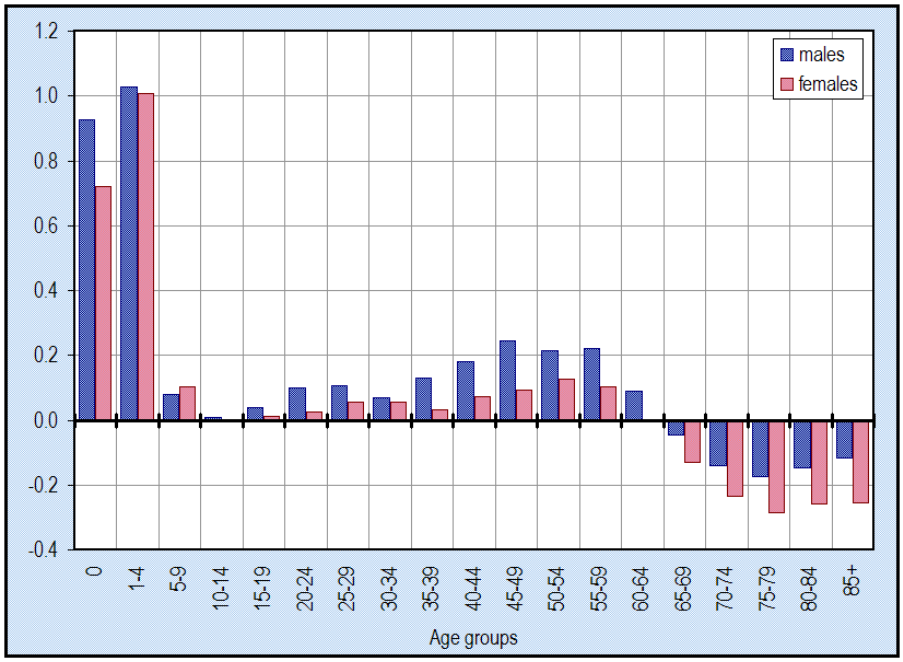
has not started yet in the Azerbaijani population. This finding corresponds with the results of preceding decomposition of life expectancy at birth increase on particular age groups contributions.

Fig. 17 – Contribution of age groups to the change of life expectancy at birth between 1981 and 2008, Azerbaijan, males and females



Source: own calculations

Fig. 18– Contribution of age groups to the change of life expectancy at birth between 1990 and 2008, Azerbaijan, males and females



Source: own calculations

Regarding the mortality forecast it is clear that principal and probably also relatively easy mobilizing reserves of the overall mortality reduction are still in the initial years of life, namely in the first year of the age. Reserves even bigger by their potential extent are in old and the

oldest ages (fig. 18). However, with respect to the recent reverse developments in the later age categories, the quantum and tempo of their involvement into the expected growth of life expectancy is very difficult to predict. It is very important to incorporate into particular mortality scenarios duration of the third stage as well as time parameters and scale of moving into the fourth stage of epidemiological transition. At the same time, continuity of the recent and future developments should be kept in every respect when estimating future values of mortality rates.

Tab. 9 – Mortality by main causes of death (per 100.000 population), Azerbaijan, 1995-2008

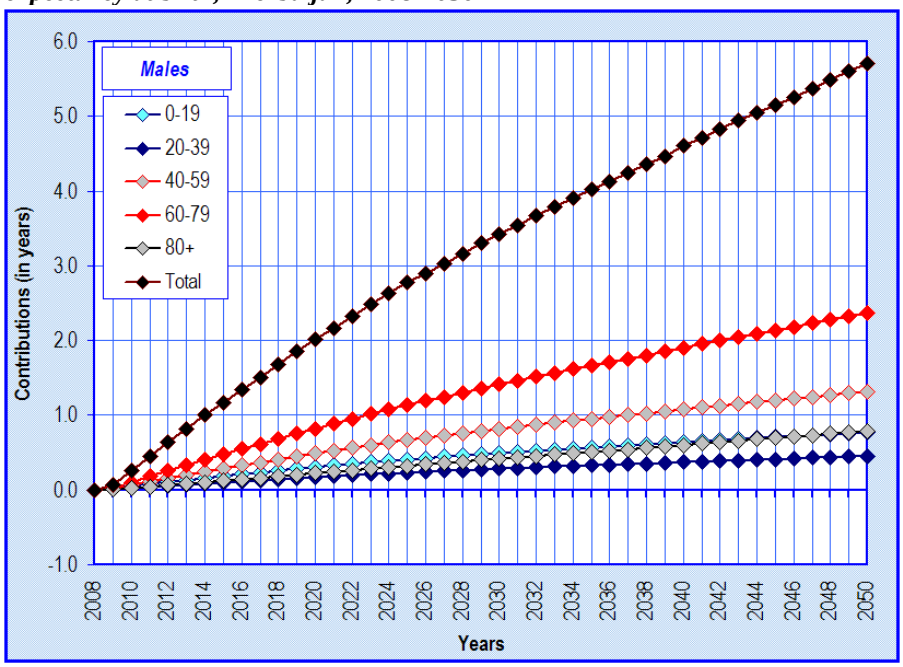
Main causes	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008
All deaths	**671.9**	**589.0**	**566.7**	**577.8**	**603.9**	**605.5**	**628.2**	**624.6**	**634.1**	**615.8**
diseases of the circulatory system	340.6	330.5	316.2	329.2	344.6	348.0	355.3	355.2	358.8	363.6
neoplasm	62.9	64.1	68.3	72.8	77.0	74.6	77.2	77.9	78.6	76.1
diseases of respiratory system	86.3	53.1	44.0	39.7	38.6	39.2	37.1	34.2	44.0	33.3
diseases of digestive system	34.9	33.1	32.4	34.5	35.9	37.0	37.7	39.6	37.9	36.8
injuries, poisoning and some other results of impact of external reasons	46.5	26.4	24.8	23.2	25.8	27.5	32.6	32.1	35.5	28.6
symptoms, indications and inadequate conditions specified in clinic and laboratory examinations not classified in other section	17.3	16.1	13.5	15.3	15.1	20.0	25.6	24.0	20.3	16.9
diseases of urogenital system	10.3	11.5	9.9	9.0	11.0	12.8	13.9	15.6	14.7	14.1
endocrine system diseases, malnutrition, metabolism	12.0	13.6	16.6	17.0	16.1	16.3	16.6	18.1	13.7	12.6
some infectious and parasitic diseases	30.1	19.8	19.2	17.4	15.9	13.6	13.3	10.8	11.8	10.5
diseases of the nervous system	11.5	10.0	11.6	10.1	11.6	6.7	7.5	6.3	7.1	11.4
congenital anomalies (developmental defects, deformations, chromosomes disorder)	4.1	1.6	1.9	1.9	2.2	3.4	3.9	3.8	5.1	5.3
blood and hematogenic organs diseases and separate disturbances of normal process of immune system mechanism	3.3	2.0	2.3	2.3	2.6	1.5	1.8	1.3	1.4	0.9
pregnancy, labor and postpartum	0.7	0.6	0.4	0.3	0.3	0.4	0.5	0.6	0.6	0.5
diseases of osteomuscular systems and connective tissues	0.7	0.7	1.0	0.7	1.6	0.4	0.7	0.4	0.4	0.5
psychical disturbance	3.3	1.5	1.0	1.0	1.4	0.4	0.7	0.5	0.3	0.4
diseases of skin and subskin tissues	0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.2
certain conditions originating in perinatal period	7.3	4.4	3.6	3.3	4.1	3.5	3.6	4.0	3.8	4.1
other causes of death	-	-	-	-	-	-	-	-	0.0	0.0

Source: State Statistical Committee of the Republic of Azerbaijan

In sum, future changes of mortality are based on the detailed analysis of this process by age and sex and predicted changes in the health situation in the country. Examination of similar trends in life expectancy in the population history of the Czech Republic revealed that in the end

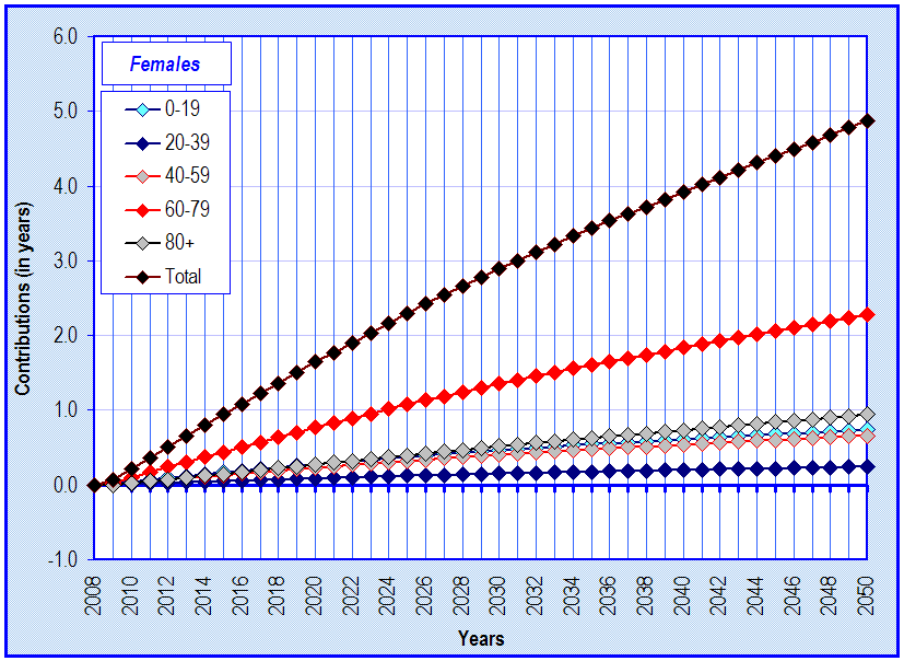
of 1980s and beginning of the 1990s the values of life expectancy at birth for Azerbaijan were on the comparable level with those for the Czech Republic. These findings were consequently taken into account when mortality parameters were forecasted. The expected improvements in the life expectancy by contributions of selected age groups to the assumed increase of life expectancy at birth between 2008 and 2050 are illustrated by figures below.

Fig. 19 – Expected contribution of basic age groups to the change in life expectancy at birth, Azerbaijan, 2008-2050



Source: own calculations

Fig. 20 – Expected contribution of basic age groups to the change in life expectancy at birth, Azerbaijan, 2008-2050



Source: own calculations

4.3 International migration

In the contemporary world, the component of international migration plays generally a significant role in the population developments. Moreover, in a globalizing world, under influence of a wide variety of rapidly changing economic, social, political and environmental factors the migratory processes are becoming more and more dynamic and complex. Additionally, the fact that data on past trends of movements of people across international borders is often scanty, limited or incomplete makes this volatile process much more complicated to estimate. As argued by Coleman (2008), migration is difficult to analyze: the process is complex, the data poor, and the theory unsatisfactory.

Well-known findings of the earliest migration theorist Ravenstein about migration processes as the resultant of push and pull factors formulated in his "Laws of migration" in the late 19th century (Ravenstein, 1876, 1885, 1889) continue to serve inherently as the starting point for all serious discussions and models of migration patterns nowadays. He outlined that migration is governed by a push-pull process and that unfavourable conditions "push" people out the one place and favorable conditions in an external location "pull" them in. In fact, this concept was later developed by many theorists and many theories were derived to explain the migration processes more or less through a variety of push and pull factors. However, presented by several authors reviews of the existing theories and models reveal many partial theories examining the process of international migration from the point of different disciplines but indicate that there is no single integrated and comprehensive theory in this field (Massey et al., 1993; Bauer and Zimmermann, 1995). "A variety of theoretical models has been proposed to explain why international migration begins, and although each ultimately seeks to explain the same thing, they employ radically different concepts, assumptions, and frames of reference" (Massey et al., 1993, p.432).

The analysis of the dynamics of migration flows as s a complex phenomenon goes beyond demographic, economic and spatial considerations including the facts of individual behaviour and at the same time takes into account how these factors change with time and affect each other (Leloup, 1996). Nowadays affected by globalization processes the complexity of migratory phenomena increases (Koryś and Okólski, 2004), while the diversity between the mechanisms driving internal and international migration becomes less and less obvious (Bijak, 2006).

Coming to the situation with international migration in the Republic of Azerbaijan it can be said, that contemporarily migration processes are characterized by decreased magnitude of migration flows expressed in small values of immigrant and emigrants. The net migration was negative prior to 2007 and in the last year of observation 2008 there was indicated a positive balance. It is worth to mention that contemporary outflows are motivated by economic reasons, while in the early 1990s the emigration was characterized by political instability, national and ethnic motives.

Disintegration of the USSR and reestablishment of independence of the successor states resulted in political and economic instability, worsen living conditions and several local military conflicts. One of them, the conflict between Azerbaijan and Armenia significantly accelerated

migration processes in the region during the 1990s. Migration flows were more intensive in the early 1990s, then starting from 1996 the steady decline in migration processes was observed and in the year 2008 the balance of migration was indicated as a positive for the first time during past two decades.

Tab. 10 – International migration (thousand persons), Azerbaijan, 1990-2008

Years	Immigration	Emigration	Net migration
1990	84.3	137.9	-53.6
1991	66.3	106.4	-40.1
1992	35.7	49.9	-14.2
1993	16.3	28.5	-12.2
1994	8.6	19.6	-11.0
1995	6.2	16.0	-9.8
1996	5.8	13.2	-7.4
1997	7.5	15.7	-8.2
1998	5.4	10.5	-5.1
1999	4.8	9.1	-4.3
2000	4.4	9.9	-5.5
2001	2.6	7.3	-4.7
2002	1.2	4.3	-3.1
2003	2.5	3.8	-1.3
2004	2.4	2.8	-0.4
2005	2.0	2.9	-0.9
2006	2.2	2.6	-0.4
2007	2.0	3.1	-1.1
2008	3.6	2.5	1.1

Source: State Statistical Committee of the Republic of Azerbaijan

Thus, various socio-economic difficulties in the transition period were among the most important push factors motivated people to emigrate from the country. Moreover, the conflict in and around the Nagorno Karabakh region of Azerbaijan led to the emergence of approximately one million refugees and internally displaced persons and caused the loss of 300 thousand jobs and these facts triggered the emigration from Azerbaijan. Mentioned factors are underlying motives of people who were moving abroad the country in search of better places of livelihood. Networks of migrants from different regions and personal ties played an important role in enhancing mobility of people. According to national statistics, the main destinations of emigrating population were such CIS countries as Russia, Ukraine, Kazakhstan; among other countries preferable places to move are the USA, Israel, Germany and Turkey (tab. 11).

Tab. 11– Emigration from Azerbaijan (persons), 1990-2008

Countries	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008
Total	**137 900**	**16 033**	**9 947**	**7 288**	**4 320**	**3 754**	**2 800**	**2 906**	**2 644**	**3 083**	**2 530**
To the CIS countries											
Total	**128 300**	**13 671**	**9 517**	**7 004**	**4 224**	**3 633**	**2 690**	**2 856**	**2608**	**3 031**	**2 458**

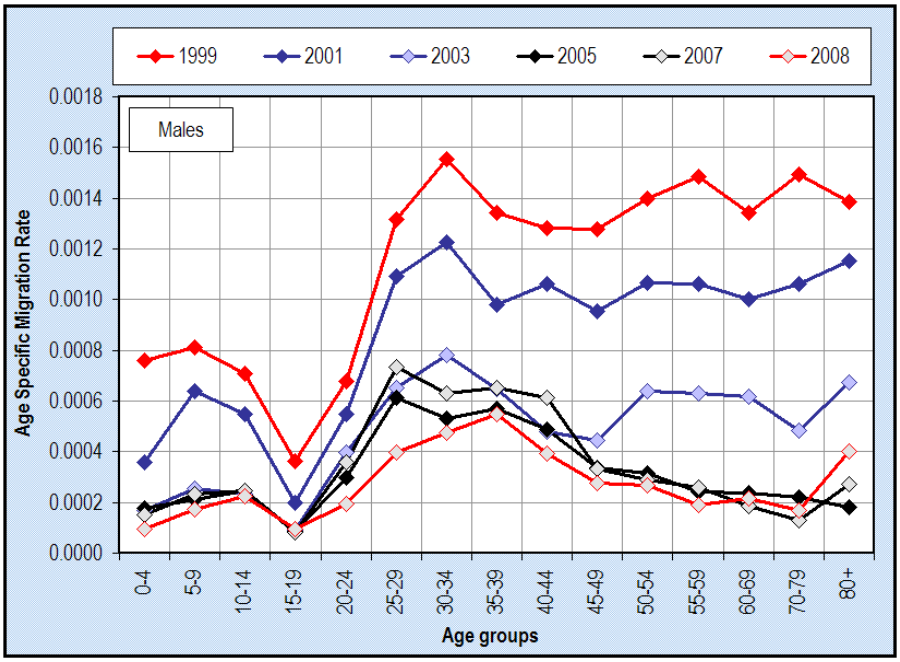
Russian Federation	77 452	11 312	8 393	6 230	3 691	3 140	2 285	2 495	2160	2 620	2 028
Ukraine	12 794	860	513	339	221	181	152	102	162	120	97
Belarus	1 904	151	148	118	88	95	80	88	101	116	98
Uzbekistan	1 234	144	46	32	18	13	12	7	8	5	12
Kazakhstan	1 975	204	174	170	125	149	121	138	153	152	201
Georgia	1 934	178	97	53	37	10	20	7	10	6	13
Moldova	228	12	7	5	8	6	9	9	3	2	2
Kyrgyzstan	212	41	31	16	15	25	2	4	4	4	1
Tadjikistan	128	7	3	1	-	1	1	1	1	-	-
Turkmenistan	1406	118	63	40	21	13	8	5	6	6	6
non-stated	29 033	644	42	-	-	-	-	-	-	-	-
To other countries[1)]											
Total	**9 600**	**2362**	**430**	**284**	**96**	**121**	**110**	**50**	**36**	**52**	**72**
Germany	20	74	62	110	40	46	32	9	4	13	8
USA	543	570	103	42	8	18	34	19	10	17	21
Israel	8 442	1 688	199	88	29	31	16	14	7	5	12
Iran	-	3	24	2	-	3	-	-	1	1	-
Turkey	2	3	23	14	3	6	11	4	8	2	7
Estonia	113	2	1	1	2	-	1	-	-	-	-
Latvia	239	5	1	-	-	-	-	-	1	8	1
Lithuania	104	7	2	3	3	1	6	-	-	1	1
Pakistan	-	-	-	-	-	-	-	-	-	-	-
Poland	4	3	-	1	-	-	-	-	-	-	-
Greece	35	3	3	-	-	-	-	-	-	-	3
other foreign countries	98	4	12	23	11	16	10	4	5	5	19

Note: [1)] In 1990-1997 persons over 18 years old
Source: State Statistical Committee of the Republic of Azerbaijan

Distinguishing emigrants by several categories, it is said, that the category of labour migrants abroad the country is likely to be one of the most numerous. As it was noted in Aliyev (2006), "according to official statistics, approximately 1.5 million Azerbaijanis (2 million according to unofficial sources) live in Russia only; 90 per cent of whom work in the informal sector" (Aliyev, 2006). Presented by statistics figures should be taken into consideration with caution, since figures on people who leave the country are based on requirements to leave one's identification document at the competent police office prior to departure, a duty that only an estimated 25 per cent of emigrants carry out (Aliyev, 2006). Nevertheless, any conjectures about the underestimation of outflows cannot be proved due to the fact that the available date enables to get an accurate picture of the present situation and how it has developed over the years.

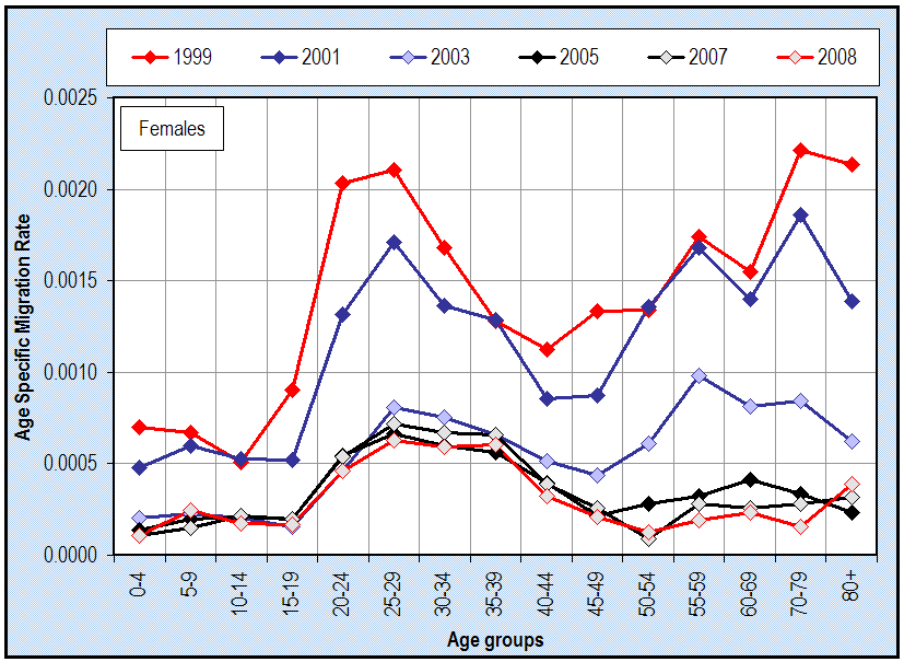
Another category of emigrants is created Azerbaijanis asylum seekers abroad. As was indicated in Aliyev (2006) "UNHCR and government reports state that approximately 4000 Azerbaijanis seek asylum in foreign countries every year, with Sweden, Germany, the Netherlands and Belgium being their preferred destinations. The number of Azerbaijanis seeking asylum in France has recently increased (UNHCR, 2003)" (Aliyev, 2006).

Fig.21 – Emigration rates, Azerbaijan, 1990-2008



Source: State Statistical Committee of the Republic of Azerbaijan

Fig. 22 – Emigration rates, Azerbaijan, 1990-2008



Source: State Statistical Committee of the Republic of Azerbaijan

According to the same sources, that during the early post-independence years Azerbaijan became host to an increasing number of foreign citizens and stateless persons. Conflicts and instability in neighboring regions increased number of migrants, particularly transiting through Azerbaijan as forced migrants who left their home lands in search of better places to live. Nowadays, the economic revival and steady development has created favourable conditions for the reverse of migration flows. It is estimated that recently experienced high annual GDP growth, driven by the dividends from the oil and gas sector as well as the development of the

non-oil sector will attract Azerbaijani emigrants to return to the home country. This has already affected the migration cycle as, according to official statistics, net migration was approximately 1,000 persons positive in 2008. Moreover, as a result of the rapid socio-economic progress and the realization of important projects in the fields of energy, transport and in other sectors, Azerbaijan is being transformed into an increasingly attractive destination country for labour migrants as well.

Tab. 12 – Immigration to Azerbaijan (persons), 1990-2008

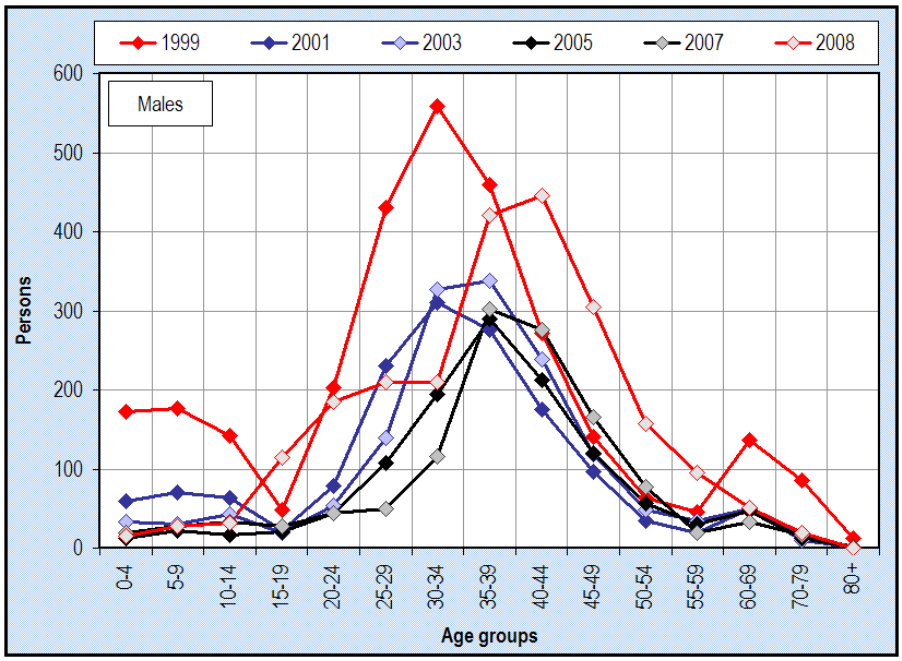
Countries	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008
Total	**84 279**	**6222**	**4361**	**2574**	**1257**	**2500**	**2407**	**2013**	**2232**	**1954**	**3597**
From the CIS countries											
Total	**83 184**	**5953**	**4233**	**2477**	**1202**	**2452**	**2334**	**1963**	**2207**	**1915**	**3188**
Russian Federation	30857	2968	2710	1677	782	1656	1466	1158	1394	1269	2024
Ukraine	4355	367	291	177	86	165	160	104	127	105	174
Belarus	549	51	29	7	9	19	21	10	28	33	63
Uzbekistan	7057	336	142	82	42	109	110	80	111	77	96
Kazakhstan	3190	341	150	107	44	96	116	78	94	92	196
Georgia	6637	942	307	210	135	204	300	379	238	158	403
Maldives	144	6	2	9	4	7	7	2	12	2	9
Kyrgyzstan	1562	38	35	22	9	15	5	12	12	10	11
Tadjikistan	147	31	6	8	7	15	5	6	7	2	4
Turkmenistan	1336	165	175	151	68	162	138	115	171	159	204
Non-stated	27350	708	386	27	16	4	6	19	13	8	4
From other countries											
Total	**1095**	**269**	**128**	**97**	**55**	**48**	**73**	**50**	**25**	**39**	**409**
Germany	…	-	2	6	-	1	2	-	-	-	7
USA	…	-	5	7	1	-	-	1	1	6	4
Israel	…	6	25	9	4	1	8	5	1	8	2
Iran	…	31	44	30	16	12	22	13	4	7	32
Turkey	…	23	17	19	21	13	22	13	7	8	267
Estonia	67	9	-	1	1	-	-	1	1	2	4
Lithuania	119	5	16	1	1	-	8	5	4	1	-
Latvia	237	35	1	7	1	7	7	5	4	1	2
Pakistan	…	2	1	3	3	5	2	3	-	-	22
Poland	…	-	-	-	-	-	-	-	-	-	-
Greece	…	-	-	-	-	-	-	-	-	-	-
other foreign countries	672	158	17	14	7	9	2	4	3	6	69

Source: State Statistical Committee of the Republic of Azerbaijan

Since 2001, the Ministry of Labour and Social Protection of the Population has been issuing individual permits for employment in Azerbaijan. Foreign nationals are mainly employed in the oil sector and also in construction, transportation, the service industry, finance and insurance sectors. A large majority of foreign nationals employed in Azerbaijan are from the United Kingdom, Turkey, Georgia (mostly Georgian citizens with Azerbaijani origin) and India. It is worth to note, that "It has long been recognized that rather complicated legislative acts

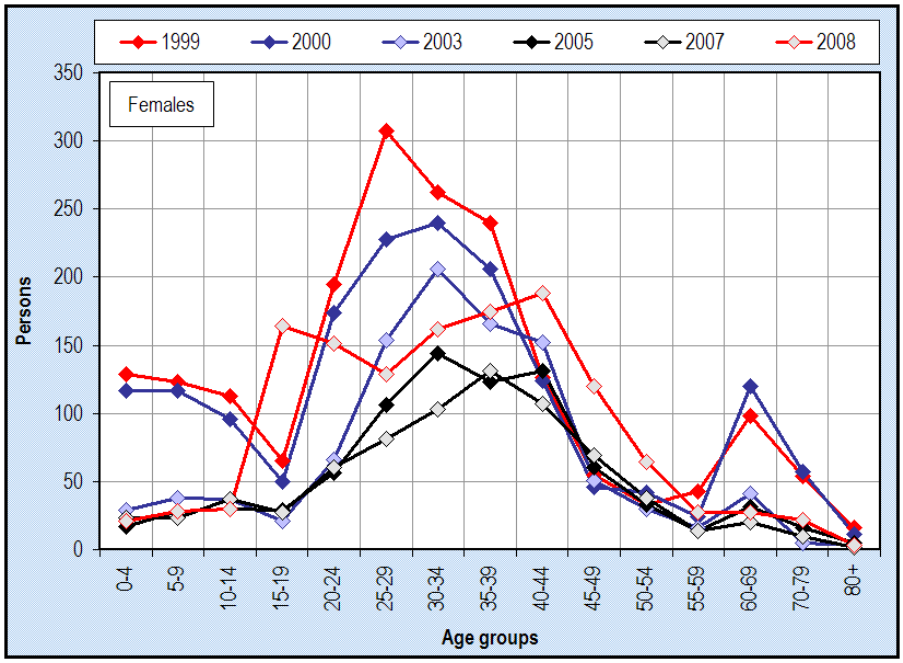
controlling inflow of foreign workforce can only lead to illegal migration of laborers, and Azerbaijan is no exception: at the beginning of 2009 there were approximately 60,000 labor migrants, but only about 6,000 of them were registered by state agencies" (http://blog.moveone.info).

Fig. 23 – Immigrants to Azerbaijan (in persons), 1990-2008



Source: State Statistical Committee of the Republic of Azerbaijan

Fig. 24 – Immigrants to Azerbaijan (in persons), 1990-2008



Source: State Statistical Committee of the Republic of Azerbaijan

Development of the national legislation and establishment of the State Migration Committee in 2007 as a particular authority for coordination of the activities stipulated by the migration

policy have an impact on improvements of services rendered in the field of entry and exit of foreigners and their registration at the place of residence; the duration and complexity of these procedure is also considered as a pull factor. For instance, it is expected that the simplification of the procedures of grating permissions to foreigners and stateless persons entering Azerbaijan for lawful residence and engaging in work activity, and of their registration at the place of residence and implementation of the principle "single window" (since 1, July, 2009) will also have effects on the migration processes towards its intensification.

It is known, that population movements across national borders are not limited by immigrants and emigrants representing flows directly in and out of the country; there is one more category of migrants, who are transiting the country. It is rather difficult task to define this category of migrants. Due to the fact that the presented below discussion is based on the findings of the research of transit migration through Azerbaijan conducted by IOM (IOM, 2003) the definitions are kept as it was used in the study. Thus, transit migrants are defined as aliens who stay in the county for some period of time while seeking to migrate permanently to another country – neither Azerbaijan nor their country of origin. Aliens, who stop in Azerbaijan only as long as necessary to continue a planned and authorized course of travel, and those who are legal members of local labour force, were not considered. In other words, transit migrants here – are people who have entered Azerbaijan (legally or illegally) and who intend to move onward to another country as their final destination.

According to findings of the mentioned above survey, the majority of the transit migrants in Azerbaijan is young adults between 18 and 34 ages, majority of which have completed secondary or vocational education (with legal migrants having more education on average than irregular migrants). Men and women were represented approximately equally among the legal migrants, whereas most of the irregular migrants were men. Substantially, transit migrant are citizens of countries in Middle East, South Asia and CIS. The common countries of final destination for the surveyed migrants were the USA, Canada (together 63 per cent) and countries of Western Europe (13 per cent) – mostly France, Germany, Austria, Italy, Norway and Sweden. At the same time 13 per cent of respondents noted that they do not have ultimate decision on final destination.

Most survey respondents had been in Azerbaijan for more that one year, that is 92 per cent of legal and 90 per cent of irregular migrants. Despite the fact that all migrants interviewed had intended to use Azerbaijan as a transit country, for 11 per cent of them Azerbaijan changed from transit state into the country of final destination.

Considering the push factors of the transit migration, it is said that they are introduced by political and economic instability in the countries of origin of migrants. The 89 per cent of the legal and 67 per cent of the irregular migrants indicated the lack of peace and instability in theirs countries as the most important reasons. One fifth of the irregular migrants cited s violation of human rights in their country. Other push factors included economic difficulties, poor living conditions, education-related concern and a lack of business opportunities in the home countries. The pull factors motivating this category of migrants to move through Azerbaijan were related with the favourable location of the country with infrastructural links to East and West as well as South and North and cultural similarities. Among other factors

attracting migrants to move through Azerbaijan as gateway it may be called the presence of acquaintances in the country, language similarities and spread of Russian language, security, stability and tolerance of the population and authorities towards the plight of migrants. More than half of the legal migrants cited geographical proximity and similarity of cultural values as the main motives in their choice of Azerbaijan as a primer destination country. The result reflects the large share of legal migrants, who were ethnic Chechens emigration from Russia. Socio-political stability in Azerbaijan motivated 17 per cent of the legal migrants. Personal ties were indicated by 13 per cent. Unlike the legal migrants, nearly one-quarter of the irregular pointed out that in their home country they were advised to migrate through Azerbaijan. The remaining 30 per cent of irregular migrants and small proportion of legal migrants gave other reasons for choosing Azerbaijan as a transit country, including religion, opportunities for running one's own business and ease of gaining employment. Curiously, during the survey there was discovered that poor knowledge of the route misled some irregular migrants to arrive in Azerbaijan instead of the place they were intending to reach, for example, Russia.

Regardless relatively detailed information in hands it is difficult to foresee future migration developments, its flows directions, sizes and demographic structures. The main reasons are low reliability of available information, namely that concerning emigration. Therefore migration was assumed constant over time in respect of its net migration size and sex and age structures of emigration intensities and numbers of immigrants.

4.4 Overview of future scenarios

The forecast is based on the assumptions on most probable fertility, mortality and net migration perspectives. Depending on the different levels, perspectives of the corresponding demographic indicators usually constitute high, medium (base) or low variant. Number of variants depends on assumptions which are considered as significant for the population development. For example, the UN World Population Prospects the 2008 Revision include eight projection variants: low; medium; high; constant-fertility; instant-replacement-fertility; constant-mortality; no change (constant-fertility and constant-mortality); and zero-migration. At a country level future trends are usually projected in three variants: low, medium, high. Through the use of alternative assumptions it is attempted to express, to some extent, uncertainty in the projections (Keilman and Cruijsen 1992). The variants differ among themselves in underlying assumptions.

The current study presents the population forecast of Azerbaijan Republic for the period 2009-2050. The scenarios produced within the study are based on the set of assumptions. The underlying assumptions are based on the analysis of recent demographic trends and an assessment of their implications for future changes. Basically, as the population perspectives on the population development of Azerbaijan are available from the UN sources, assumptions of the current study and UN projections can be compared from the presented below table.

Tab. 13 – Comparison of fertility and mortality assumptions, Azerbaijan, 2010-2050

Year	Total fertility rate		Life expectancy at birth, years			
			Males		Females	
	Current study	UN	Current study	UN	Current study	UN
2010	1.94	2.16	70.39	67.7	75.99	72.5
2020	1.91	2.03	72.14	70.0	77.42	74.5
2030	1.90	1.89	73.56	71.7	78.67	76.1
2040	1.90	1.85	74.73	73.1	79.70	77.5
2050	1.90	1.85	75.84	74.4	80.65	78.7

In addition to the principal assumptions which are expressed in the medium, high and low variant, the assumptions have been prepared for each of the three components of demographic change – fertility, mortality and migration. These variant assumptions are intended as plausible alternatives to the principal assumptions.

Tab. 14 – Expected development, Azerbaijan, 2010-2050

Year	Total fertility rate			Life expectancy at birth, years						Net migration, persons		
				Males			Females					
	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High
2008	1.94	1.94	1.94	70.13	70.13	70.13	75.78	75.78	75.78	1067	1067	1067
2010	1.91	1.93	1.95	69.98	70.39	71.15	75.69	75.99	76.68	0	885	1499
2020	1.85	1.91	2.01	70.73	72.14	73.89	76.20	77.42	78.96	-2011	532	4489
2030	1.81	1.90	2.07	71.32	73.56	75.95	76.63	78.67	80.88	-2017	591	4975
2040	1.78	1.90	2.12	71.78	74.73	77.58	77.00	79.70	82.33	-2041	538	4952
2050	1.76	1.90	2.15	72.21	75.84	79.09	77.34	80.65	83.63	-2067	533	4915

With respect to the assumptions there are three scenarios – low, medium and high. The **medium scenario** assumes moderate population development. According to this scenario it is anticipated that the life expectancy will be steadily raising, the total fertility rate will approximately remain at the level of 2008 with slight changes in age profiles and the net migration is expected to be lower than the level of 2008 but still positive. At the same time, a slight decrease of the sex ratio at birth is assumed.

Under the **low scenario** the pace of positive changes in life expectancy is predicted to be slower than in the medium variant. With regard to fertility, the low scenario increasingly takes into account the past experience of many countries experienced reductions of fertility and assumes that Azerbaijan will follow this path towards falling of fertility rates. With regard to fertility, the low scenario increasingly takes into account the past experience of many countries experienced reductions in fertility and assumes that Azerbaijan will follow the path towards fertility transition to lower rates and fall in fertility rates increasingly will face falling of with already completed transition to low fertility rates and it. In the case of quicker pace of fertility decline it is expected that there will prevail preferences to boys and this conjecture is expressed in the higher sex ratio at birth. Under this scenario the net migration is assumed to be negative.

The **high scenario** predicts that under influence of higher benefits from the general economic growth and better quality of social, health and other services population of the country will experience: more accelerated changes in the life expectancy at birth, higher total fertility rates coupled with less attention to the sex selection of newlyborns. The net migration is anticipated to be higher that in the medium variant.

Chapter 5

Forecast results

5.1 Total population

A set of selected combination of forecast values of the parameters of reproduction to the structure of the population at the beginning of 2009 were applied within the framework of the classical cohort-component forecasting model. Forecasting in one-year steps provided the expected population size by sex and age groups and in addition gave the expected number of demographic events. The obtained results show that according to the medium variant of the forecast, the population of Azerbaijan is expected to increase gradually from 8.7 million in 2008 to 10.7 million by 2050 (fig. 25). The population will continue growing until the year 2046. Consequently, over the period 2009-2045 the population of the country will grow by 22 per cent before it starts to fall.

Under assumptions set for the medium variant the total increase of the population will be generally decreasing through the forecast period and, as a result, starting from 2045 there will be observing a negative total increase. The trend towards depopulation is anticipated to start five years earlier, since 2039, under the certain assumptions set in the low variant. According to high variant, the population of Azerbaijan is forecasted to continue rising through the period until 2050 and the migration contribution is anticipated to have no negative effect on the population growth.

Figure 26 shows the effect of the changes in the birth rates assumed for the forecast years. Under the assumption of slight changes in the age structure of fertility rates in the medium variant number of births will continue to rise by 2013 before declining in the perspective. Thus, comparing to the recent years, the overall number of births is forecasted to decrease, faster at first and then after a small rise – more slowly. Generally, assuming the TFR values at approximately the same level through the forecast period anticipated decrease of live births is also related with the smaller numbers of women affected by the consequences of the raised sex ratio at birth. This parameter was assumed to be at the level of 115 males per 100 females at birth, which is lower than the current level, but higher in comparison with biological laws.

Fig. 25 – *Population size, Azerbaijan, 2008-2050*

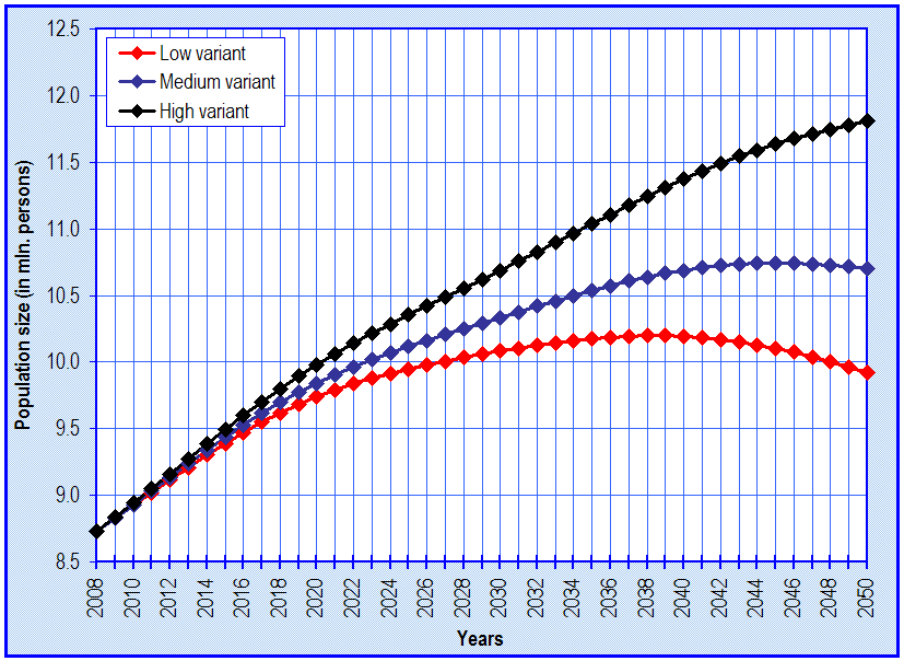
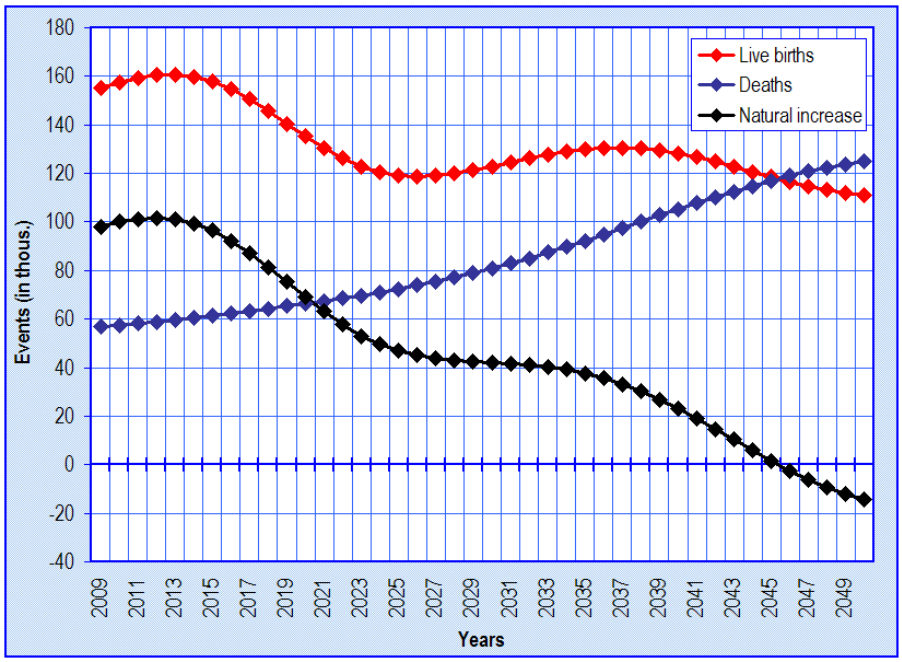


Fig. 26 – *Births, deaths and natural increase, Azerbaijan, 2008-2050*



Comparison of number of births between forecast variants, particularly when the magnitude of changes in fertility structure is small as in the case of this study, shows that different assumptions on the sex ratio have certain effects on population changes. Thus under the assumption of faster decline in TFR values and more focus on the sex preferences of having a boy-baby, the sex ratio was set to be at the level of 120 males per 100 females at birth. Consequently, according to this variant by the end of the forecast period (2050) number of births is expected to be 15.5 thousand births fewer than in the medium variant. In the high forecast variant fertility rate is set at higher level (2.15 children per woman by 2050) and lower sex ratio at birth (109 males per 100 females among live births) with the assumption of less

attention to the sex of a baby, the total number of births 30 thousand more than in the medium variant.

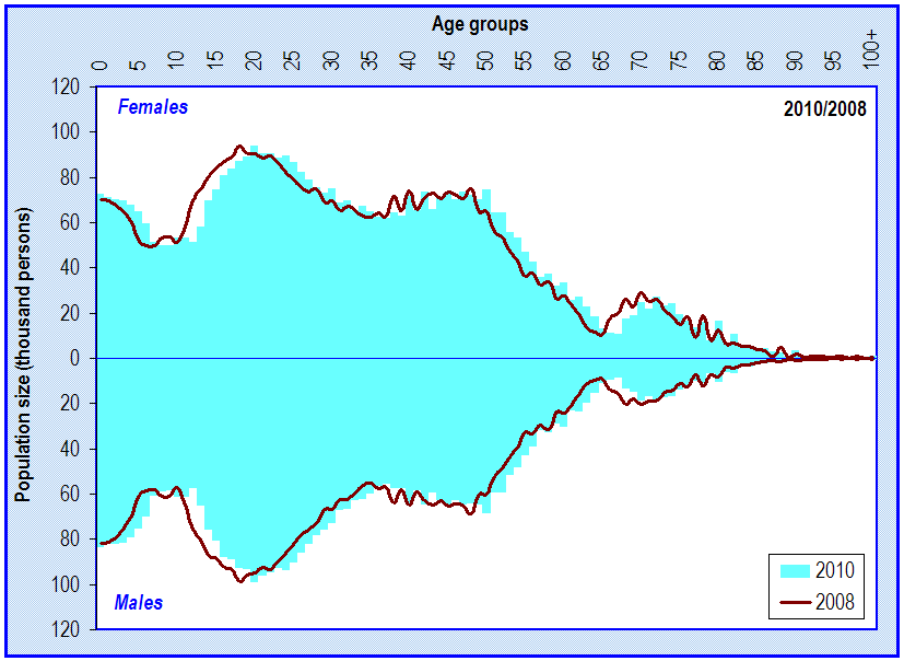
According to all scenarios the annual number of deaths is anticipated to increase in comparison with 2008. Relatively large cohorts born after the Second World War and during the 1950s and 1960s begin to reach elderly ages and contribute to this increase.

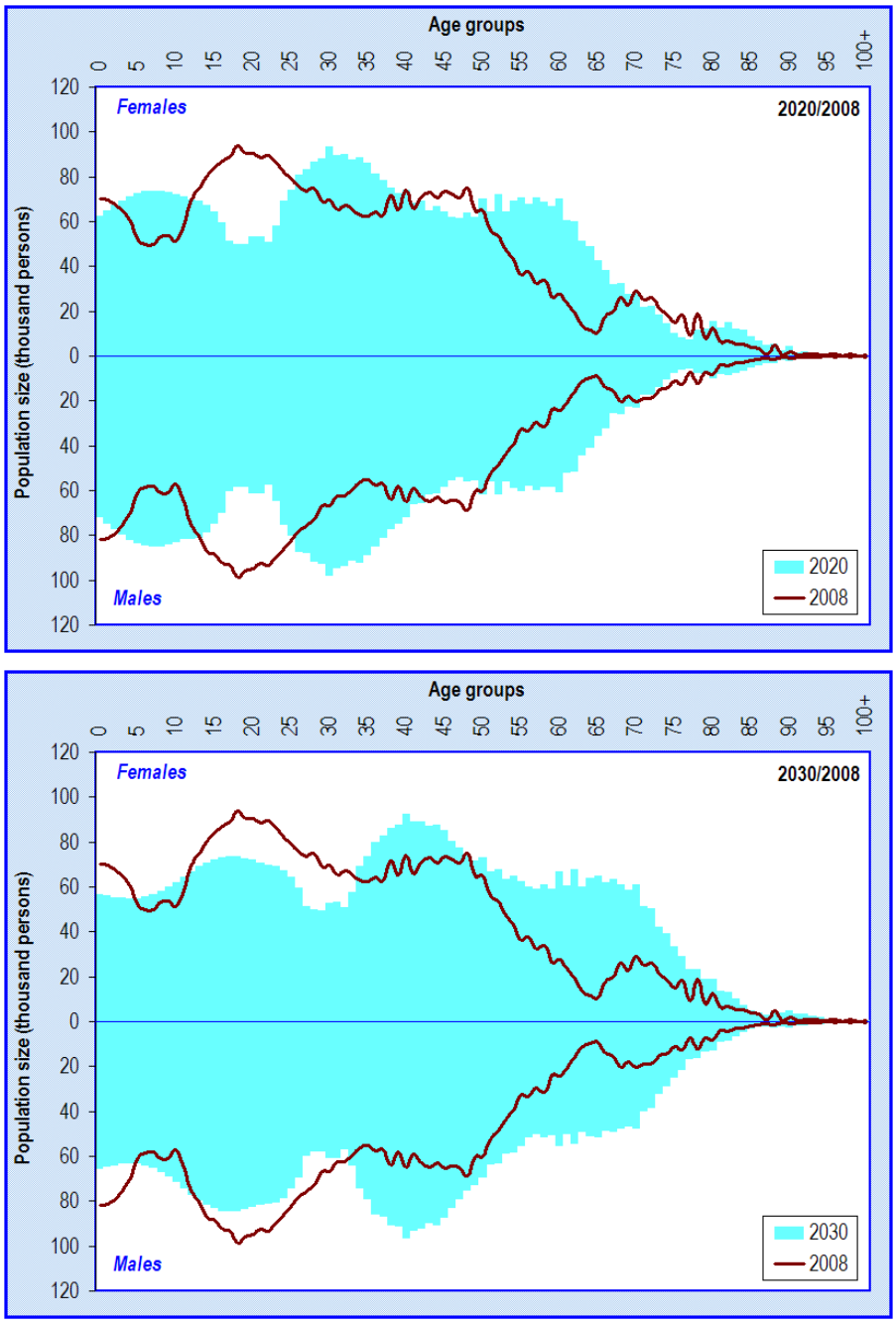
Finally, it is assumed that in the forecast period annual inward migration into Azerbaijan will be 3.5 thousand persons per year.

5.2 Age and sex structure of the population

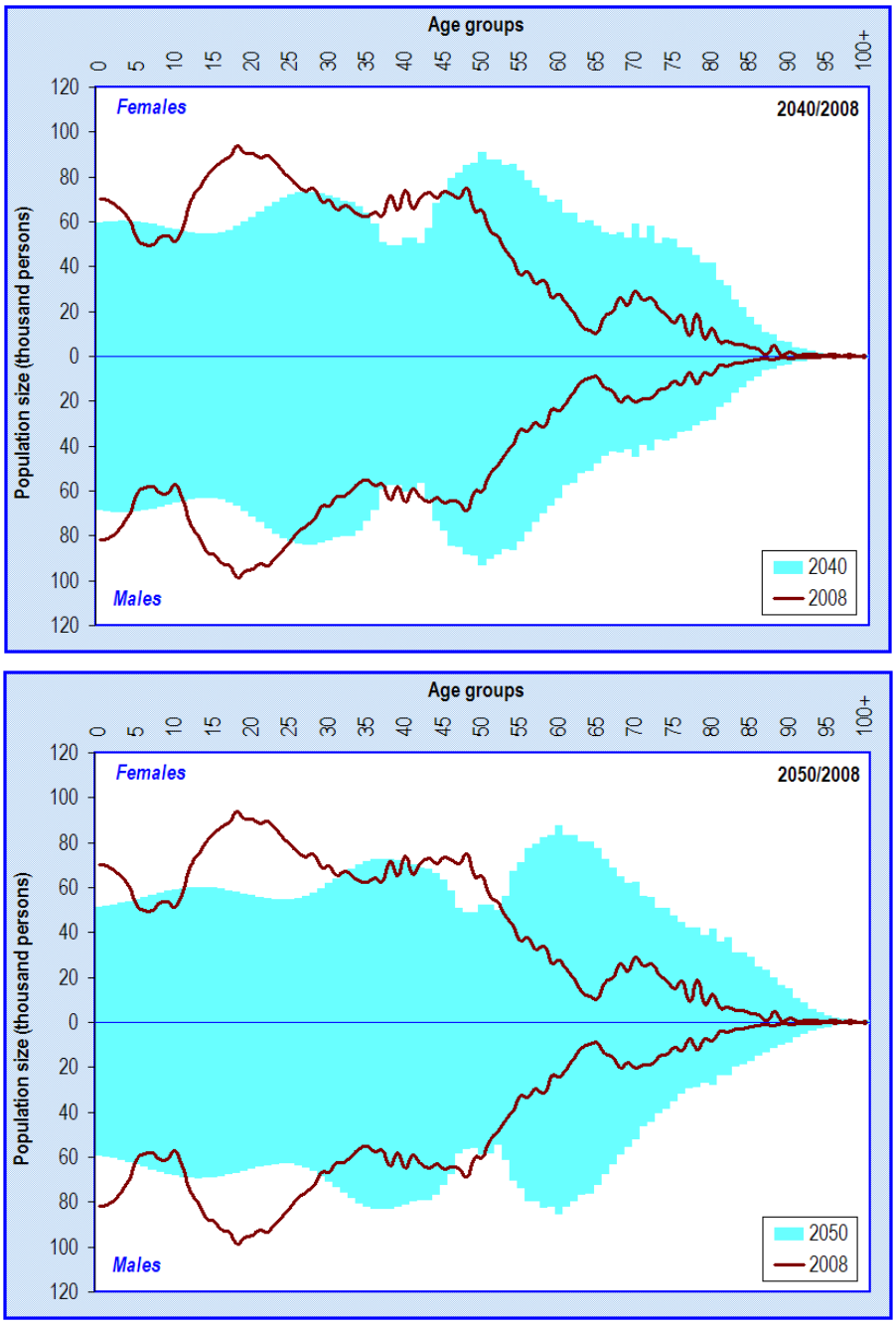
From the point of view of the overall development of society, the distribution of the population by age and sex is more important than its simple size. The age structure of the population of Azerbaijan is forecasted to change in future years, to a great extent as a result of past and future trends in number of births and changes in values of mortality rates and to a lesser extent because of the migration impact. The change in the age distribution between 2008 and 2050 is shown by figures 27-31.

Fig. – 27–31 Age and sex structure of the population of Azerbaijan, 2010, 2020, 2030, 2040 and 2050 in comparison with 2008, medium variant




Age groups
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100+
Females
2020/2008
Males
Population size (thousand persons)
120 100 80 60 40 20 0 20 40 60 80 100 120
2020
2008

Age groups
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100+
Females
2030/2008
Males
Population size (thousand persons)
120 100 80 60 40 20 0 20 40 60 80 100 120
2030
2008

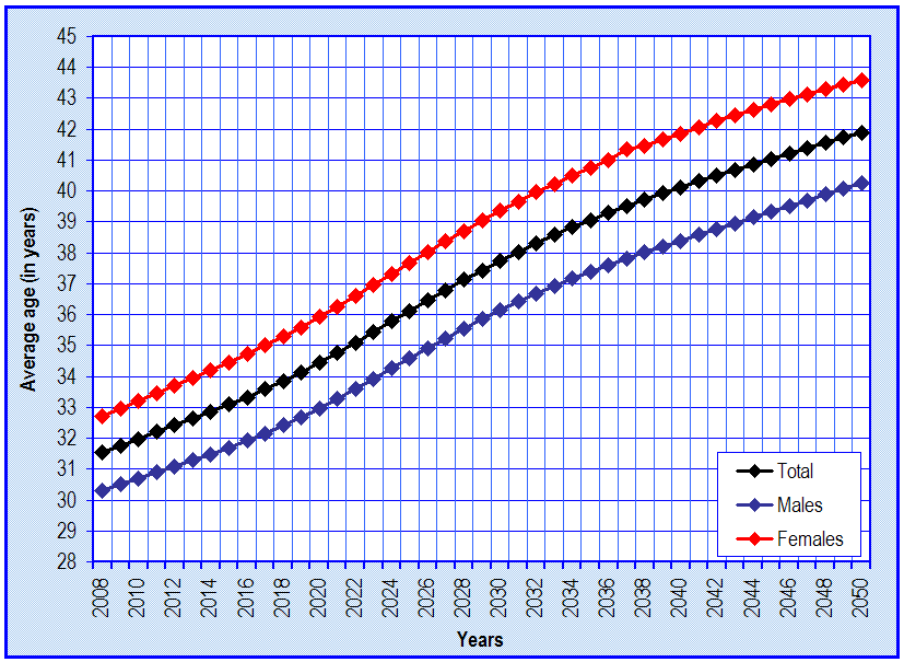


Forecasted results show continuing ageing of the population through the whole period 2008-2050. Over this period the number of elderly people will significantly increase in comparison with the number of younger population. Particular impact will have relatively large cohorts born after World War II and in following periods, characterized by high fertility levels, that are the generations of the 1950s and the 1960s. Consequently, as they will be reaching elderly ages they will be accelerating increase of the population in old age groups. Moreover, by the year 2050 large cohorts of people born between the 1980s and beginning of 1990s will be approaching to the elderly ages and in future periods will cause even higher numbers of the old population.

Similarly, while the proportion of the old population will be growing, the age structure will become gradually older and the average age will be rising as well. Thus, between 2008 and

2050 the mean age will rise from 30.3 to 40.3 years for males and from 32.7 to 43.6 years for females (fig. 32).

Fig. 32 – Average age of population, Azerbaijan, 2008-2050, medium variant



Projected future trends in the size of the three broad subgroups of the population are illustrated in the figures below (fig. 33 and 34). The total number of children aged under 15 is forecasted to decrease by 8 per cent from 1.98 million in 2008 to 1.81 million persons by 2050. During the same period the proportion of this age group in relative structure will be continuously decreasing from 22.7 to 17.0 per cent.

Fig. 33 – Population age composition, Azerbaijan, 2008-2050, medium variant

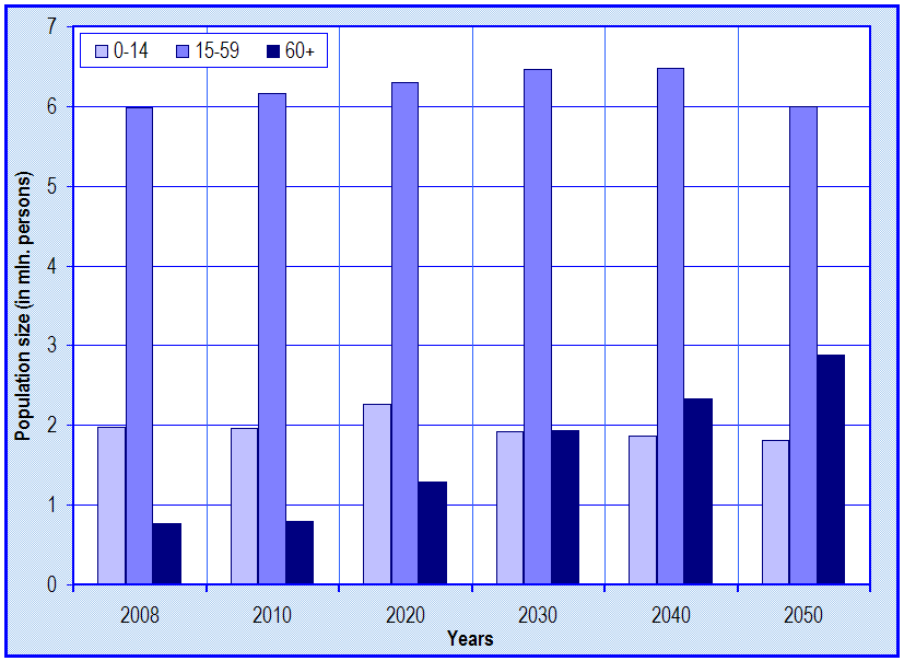
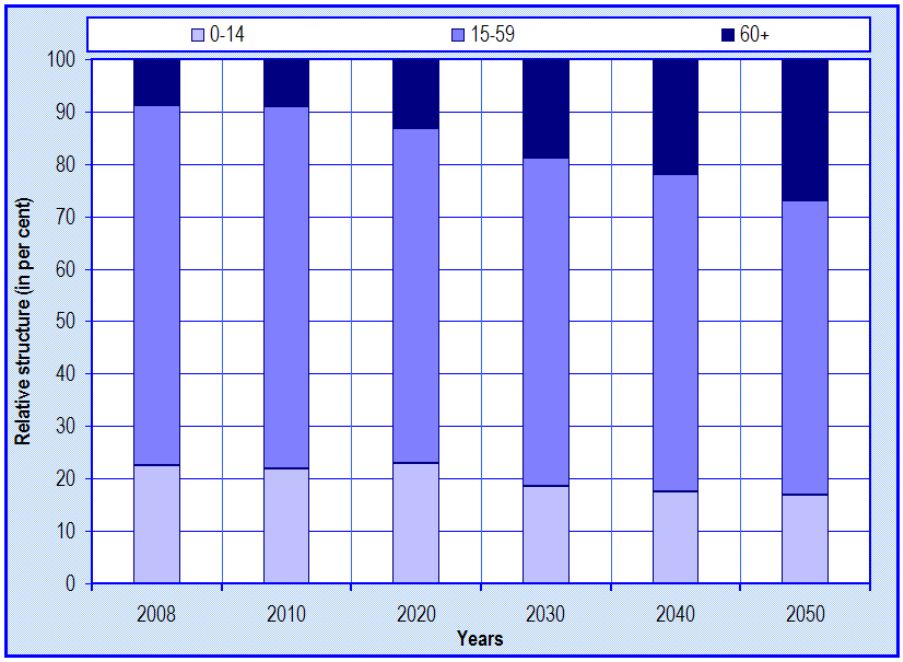
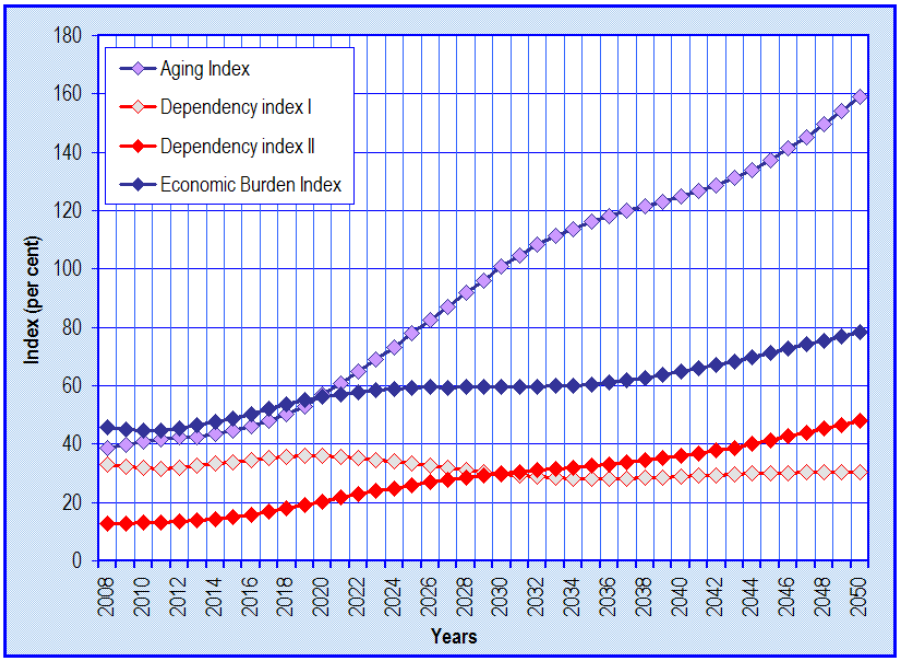


Fig. 34 – Population age composition, Azerbaijan, 2008-2050, medium variant



The forecasted number of population in the age group 15-59 will be rising and in 2035 it will reach the level of 6.7 million persons, which constitutes 62.3 per cent of the total population. During the next period population aged 15-59 will be decreasing and by 2050 the share of this age group will fall to 56.1 per cent of the total population of the country. It should be mentioned, that increasingly growing population at older ages coupled with the reducing young population influence on the structure of the working age population in such a way that it becomes older.

Fig. 35 – Dependency ratios, Azerbaijan, 2008-2050, medium variant



Note: *Aging index* – number of persons aged 60 and older per 100 children aged 0-14
Dependency index I – number of children aged 0-14 per 100 persons aged 15-59
Dependency index II – number of persons aged 60 and older per100 persons aged 15-59
Economic burden index – number of children aged 0-14 and number of pers. aged 60 and older per 100 pers. at 15-59

During the forecast period the number of people over 60 ages is projected to increase dramatically (by 277 per cent) from 0.8 million in 2008 to 2.9 million persons by 2050. In the relative structure the population of this age group will rise from 8.8 to 27.0 per cent.

The changes in the age structure will, in time, have a marked effect on the future proportion of dependants in the population. Figure 35 shows changes in the projected dependency ratios. The economic burden index represents the "total" dependency ratio and in the forecast period it is expected that it will be gradually rising from 46 in 2008 to 78 dependants per 100 persons of working age in 2050. However, it is necessary to take into account that the age boundaries used for the computation of the indexes, in fact, are somewhat approximate and widely-used boundaries. Moreover, in reality the age when full-time education ends and retirement starts in reality are at a range of ages. However, labour market changes are more important factor than demographic trends in their influence on real (economic) dependency (Johnson and Falkingham, 1992).

At the same time, it is worth to mention that the number of 15-year-olds entering the working age population is expected to fall from 2008 by 37 per cent to 2013, from 172.6 thousand persons to 108.3 thousand persons. Later, the slight increase with further decrease is anticipated, but from 2016 and to 2028 population of this one-year age group is expected to be growing steadily before the smaller cohorts of births onwards result in a rise.

The dependency index I or youth dependency ratio will decrease from 33 in 2008 to 30 persons aged 0-14 per 100 persons aged 15-59. However, the changes of the total dependency ratio values are much more greatly affected by the forthcoming rise of the old dependency ratio values and population aging. Accordingly, the dependency index II or old dependency ratio values will rise from 13 to 48 persons of the age 60 and above per 100 persons aged 15-59. The changes of the values of aging index in the forecast period can be interpreted as a rise from 40 persons to 159 persons aged 60 and above per 100 children aged 0-14.

Splitting the youth and old population on more detailed age groups represents anticipated changes in these population groups (fig. 36-39).

With regard to the changes in the population sex structure, it is expected that under assumption of the medium variant, the raised sex ratio at birth will lead to the fact, that in time the sex smoothing will take place in higher ages in comparison with the previous periods (tab.10). The consequences of this sex disbalance will be revealed in the deficit of women.

In sum it should be noted, that the size and the anticipated changes in demographic structures are based on the changes in reproductive behaviour during last periods. Some factors of future population development cannot be changed since they are based on the existing structure but those which relating to future changes in fertility rates, can to some extent be affected by social policy. It is important to take into account the actual and the probable increases in of the expected population development into consideration and to bear them in mind in all economic and social forecasts.

Fig. 36 – Children and youth population, Azerbaijan, 2008-2050, medium variant

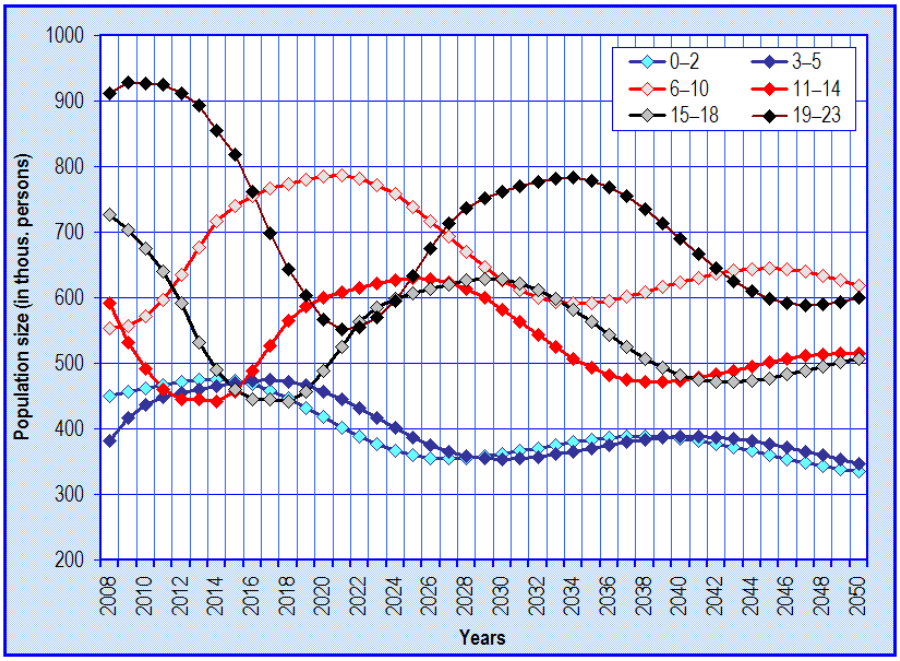


Fig. 37 – Children and youth population, Azerbaijan, comparison between 2008 and 2050, medium variant

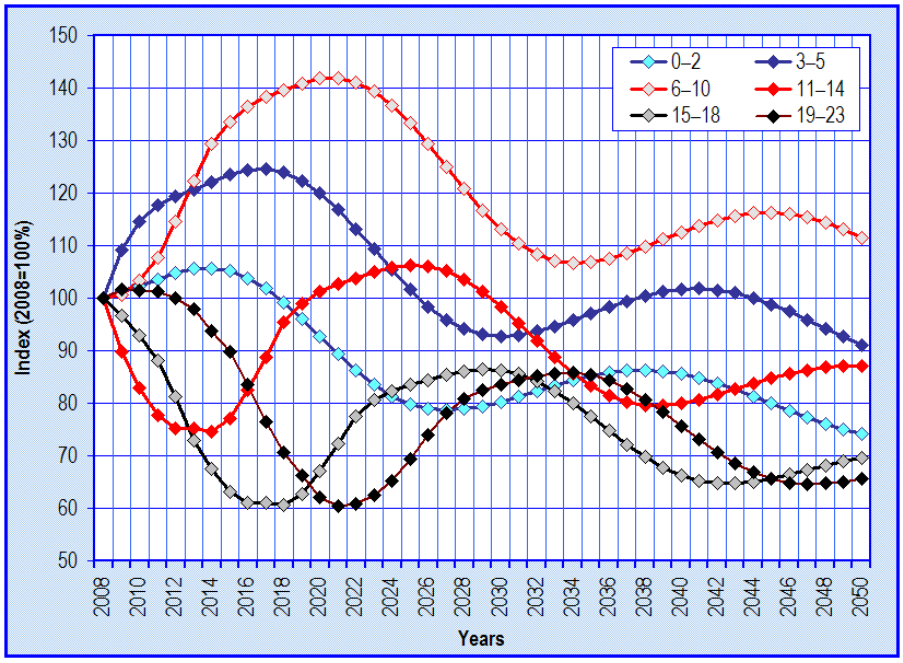


Fig. 38 – Elderly population, Azerbaijan, 2008-2050, medium variant

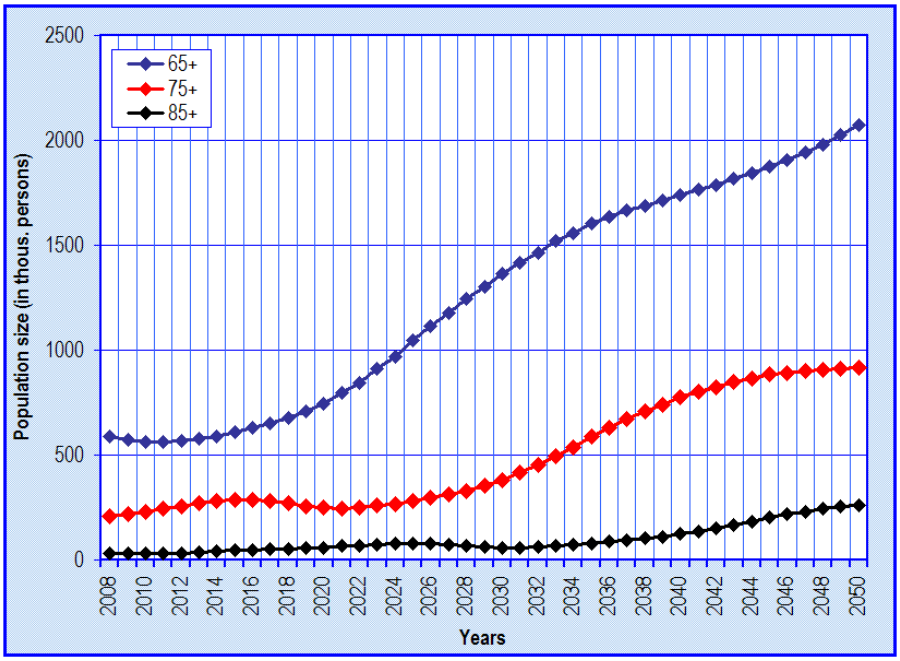
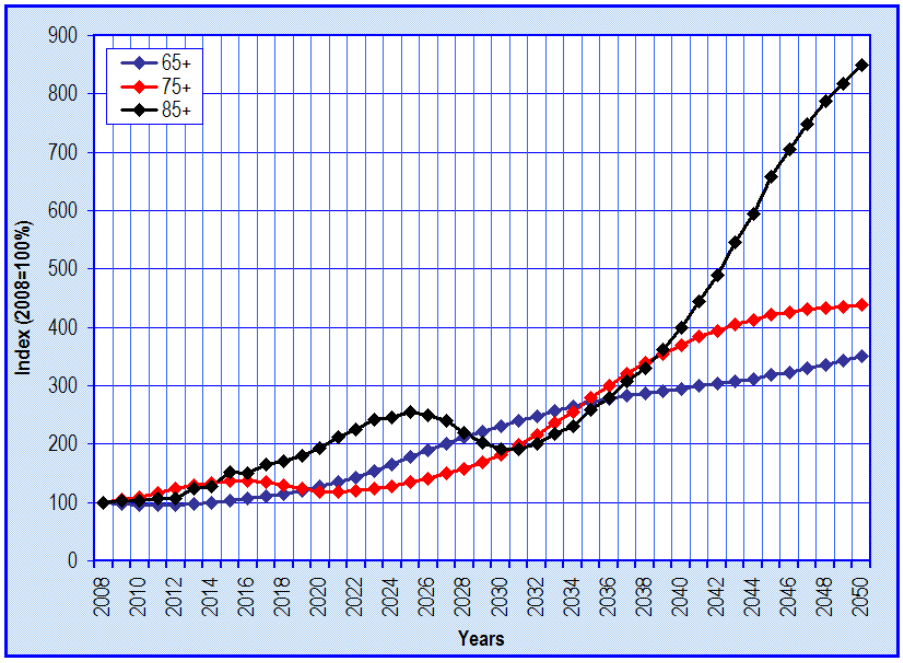


Fig. 39 – Elderly population, Azerbaijan, comparison between 2008 and 2050, medium variant



Tab. 15 – Population sex ratio, Azerbaijan, 2008-2050, medium variant

Age	2008	2010	2015	2020	2025	2030	2040	2050
0	116	115	115	115	115	115	115	115
1–4	117	116	115	115	115	115	115	115
5–9	116	117	116	115	115	115	115	115
10–14	109	112	117	116	115	115	115	115
15–19	105	106	112	116	116	115	115	115
20–24	104	105	106	112	116	116	115	115

25–29	101	104	105	106	112	116	114	114
30–34	93	96	103	104	106	111	115	114
35–39	89	90	95	103	104	105	115	114
40–44	88	88	89	95	103	104	111	114
45–49	91	89	88	89	94	102	104	114
50–54	92	92	88	86	87	93	101	109
55–59	90	90	89	85	84	85	98	101
60–64	85	86	86	85	82	81	88	96
65–69	78	79	82	81	81	78	79	91
70–74	73	72	73	77	76	76	73	80
75–79	73	71	65	67	71	71	69	70
80–84	61	64	63	59	61	65	65	63
85–89	48	51	55	55	52	55	59	58
90–94	44	37	43	48	49	47	54	57
95–99	35	38	31	39	45	47	51	58
100+	71	39	35	31	41	49	56	71
Total	98	98	99	100	100	101	102	103

Chapter 6

Conclusion

The main purpose of the study was to produce a population forecast by sex and one-year age groups for the Republic of Azerbaijan for the period 2009-2050. The forecasting process consisted from the several stages, which are included in the general structure of the production process of a forecast. Due to restrictions of the available data during analysis of the forecasting components development, a number of methods were applied. Thus, in order to obtain one-year intensities from available five-year intensities and to use those in the analysis and further incorporation into the cohort-component projection model distributional methods were applied. With regard to mortality, method of reconstruction abridge life tables into complete life tables was applied and mortality in old ages were described by an appropriate model. The estimated intensities were utilized in the current trends analysis serving as a background for forecasting the parameters of the cohort-component projection model. During the population forecasting the cohort-component projection model was used and population was forecasted in three scenarios with the presentation of results in chapter 5. Underlying assumptions were based on analysis of the recent demographic trends and an assessment of their implications for future changes.

The study does not claim to be exhaustive with regard to analysis of causes, effects and provision of comprehensive explanations to the observed nowadays trends as well as to claim on absolutely certain results of the forecast. It needs to be kept in mind, that the demographic future of any country is uncertain (Keilman, 1990). In this respect it should be noted that, as it was argued in Long (2002), "Evaluation encompasses more than just accuracy. It extends to the quality of methods, the internal consistency of projections, the utility of projections, and many other topics. Projection should be judged not just by its numerical results but the entire set of methods, assumptions, and input data lying behind the numbers" (Long, 2002, p. 140).

With regard to the future research orientation following can be noted. Production of new reviewed forecasts on the regular basis may contribute to the accuracy of the population forecast. Incorporation into the model more detailed parameters will be useful as well. At the same time researches based on special surveys may shed light into the many issues mentioned within the basic analysis in the study. Detailed analysis, assessment of accuracy and quality of statistical data directed on a search of appropriate set of methods and approaches for demographic estimations deserve special researches. Broadly speaking, the future research can be concentrated as on the studies focused on the in-depth analysis and estimation of the current population development so on the wide scope of methods and approaches to contribute to the population forecasting in Azerbaijan.

BIBLIOGRAPHY

Abramowitz, M.; Stegun, I. (eds.), (1965). Handbook of Mathematical Functions, *Dover Publication*, New York.

Alho, M. J.; Spencer D. B. (2005). "Statistical Demography and forecasting", New York: Springer, 2005, xxvii + 410 pp.

Aliyev, A. (2006). "Migration to and from Azerbaijan", in Migration Perspectives, 2006.

Armstrong, J. S. (1985). "Long-Range Forecasting: From Crystal Ball to Computer". New York: Wiley-Interscience.

Ascher, W. (1978). "Forecasting: an appraisal for policy-markers and planners". *The Johns Hopkins University Press*, Baltimore and London.

Attane, Is.(2005) "Chinese population challenges: fewer girls, more old people" *Population and Societies, No. 416, 1-4.*

Bauer, T.; Zimmermann, K. F. (1999). "Assessment of Possible Migration Pressure and its Labour Market Impact Following EU Following EU Enlargement to Central and Eastern Europe". *IZA Research Report 3.* Institut zur Zukunft der Arbeit, Bonn.

Becker, G. (1981). "A Treatise on the Family". Cambridge: Harvard University Press.

Bijak, J. (2006). "Forecasting international migration: selected theories, models and methods". *CEFMR Working Paper 4/2006.* Warsaw: CEFMR. Retrieved from: http://www.cefmr.pan.pl /docs/cefmr_wp_2006-04.pdf

Birdsall, N.; Kelley, A. C.; Sinding, W. S. (eds.), (2001). "Population Matters: Demographic Change, Economic Growth, and Poverty in the Developing World", *Oxford University Press.* Retrieved from: http://www.amazon.co.uk/gp/reader/0199244073/ref=sib_dp_pt#reader-link

Blau, Z. (2009). "Azerbaijan's New Migration System". Retrieved from: http://blog.moveone.info /industrynews/azerbaijan-migrtion-system/

Bloom, E. D.; Williamson, J. G. (1998). "Demographic Transitions and Economic Miracles in Emerging Asia", *World Bank Economic Review, Oxford University Press*, Vol. 12(3), 419-55.

Bloom, E. D. (1999). "Population Growth, Structure, and Policy: Comment". In *Population Economics, Demographic Transition, and Development: Research and Policy Implications,* edited by Mason A.; Merrick T.; Paul Shaw R., Washington, D.C.: World Bank.

Bloom, D.; Canning, D. (2000). "The Health and Wealth of Nations". *Science* No. 287, 1207-1209.

Bloom, D.; Canning, D.; Malaney, P. (2000). "Demographic Change and Economic Growth in Asia". *Population and Development Review*. Vol. 26, 257-290.

Bloom, D. E.; Canning, D. (2001a). "Cumulative causality, economic growth, and the demographic transition". In *Population Matters: Demographic Change, Economic Growth, and Poverty in the Developing World,* edited by Birdsall, N.; Kelley, A.; Sinding, S. Oxford: Oxford University Press, 165-197.

Bloom, D.; Canning, D. (2001b)."The Health and Poverty of Nations: From Theory to Practice". *Unpublished manuscript,* May 2001.

Bloom, E. D.; Canning, D.; Sevilla, J. (2001). "Economic Growth and the Demographic Transition", *NBER Working Paper No. 8685.* Retrieved from: http://www.nber.org/papers /w8685.pdf?new window =1

Bloom, D.E.; Nandakumar, A.K.; Bhawalkar, M. (2003). "The Demography of Aging in Japan and the United States". In *Aging and Health: Environment, Work and Behavior,* edited by Hedges G., Cambridge, MA: Harvard University Printing and Publication.

Bloom, D.; Canning, D.; Sevilla, J. (2004). "The Effect of Health on Economic Growth: Theory and Evidence". *NBER Working Paper 8587.* Retrieved from: http://www.nber.org/papers/w8587

Boleslawski, L.; Tabeau, E. (2001)."Comparing Theoretical Age Patterns of Mortality Beyond the Age of 80". In *Forecasting mortality in developed countries: insights from a statistical, demographic and epidemiological perspective,* edited by Tabeau, *E.; Heathccot, C.;* Kluwer. Academic Publishers, Dordrecht, 2001, 127-155.

Bongaarts, J. (1994). "Population Policy Options in the Developing World". *Science,* Vol. *263,* 771-776.

Bongaarts, J. (1996). "Population Growth Scenarios and Policy Options". *UNU/IAS Working Paper* No. 2. UNU, Tokyo.

Bongaarts, J.; Feeney, G. (1998). "On the Quantum and Tempo of Fertility". *Population and Development Review*, Vol. 24(2), 271-291.

Bongaarts, J. (1999). "Future Population Growth and Policy Options". In *Population Economics, Demographic Transition, and Development: Research and Policy Implications*, edited by Mason A**.;** Merrick T**.;** Shaw R. P**.** Washington, D.C.: World Bank, 1999, 55-65.

Bongaarts, J. (2002). "The end of the fertility transition in the developing world". *Working paper161 prepared for the UN Expert Group Meeting on "Completing the Fertility Transition",*

New York, 11–14 March 2002. New York: United Nations, Department of Economic and Social Affairs, Population Division. Retrieved from: http://www.popcouncil.org/pdfs/wp/ 161.pdf

Bongaarts, J. (2008). "Fertility transitions in developing countries: Progress or stagnation?". *Studies in Family Planning, Vol.* 39(2),105–110. Working Paper N 7. New York: Population Council. Retrieved from: http://www.popcouncil.org/pdfs/wp/pgy/007.pdf

Booth, H. (2006). "Demographic forecasting: 1980 to 2005 in review". *Working paper in demography,* No. 100. Retrieved from: http://adsri.anu.edu.au/pubs/demog-pubs/WorkingPapers /100 .pdf

Boudon, R. (1986)."Theories of Social Change: A Critical Appraisal*". Polity Press*, London.

Brass , W. (1974). "Perspectives in population prediction: illustrated by the statistics of England and Wales". *Journal of the Royal Statistics Society A*, Vol. 137, 532-583.

Bryant, J. (2005). "The relationship between economic development and the timing and pace of fertility decline". *Working paper presented on International Union for the Scientific Study of Population XXV International Population Conference*, Tours, France, July 18-23, 2005. Retrieved from: http://iussp2005.princeton.edu/download.aspx?submissionId=51035

Burcin, B; Tesárková, T.; Šídlo, L. (2009). Nejpoužívanější metody vyrovnávání a extrapolace křivky úmrtnosti a jejich aplikace na českou populace. Praha, 2009.

Caldwell, C. J.; Caldwell, K. B. (2006). "Demographic transition theory". *Dordrecht, The Netherlands: Springer*. Retrieved from: http://books.google.com/books?id=_54JBLG7V1QC& printsec=frontcover&source =gbs_navlinks_s#v=onepage&q=&f=false

Carnes, B.A.; Olshansky, S.J.; Gavrilov, L.; Gavrilova, N.; Grahn, D. (1999). "Human Longevity: Nature vs Nurture – Fact or Fiction". *Perspectives in Biology and Medicine* , Vol. 42(3), 422-441.

Caselli, F; Esquivel, G.; Lefort, F. (1996). "Reopening the Convergence Debate: A New Look at Cross-Country Growth Empirics". *Journal of Economic Growth, Vol.1,* 1369-389.

Chung, W.; Das Gupta, M. (2007). 'The Decline of Son Preference in South Korea: the roles of development and public policy". *Population and Development Review,* 33 (4), 757–783.

Coale, J. A.; Hoover, M. E.(eds.) (1958). "Population growth and economic development in low-income countries : a case study of India's prospects", *Princeton University Press*, Princeton, N. J.

Coale, J. A. (1986). "Demographic effects of below-replacement fertility and their social implications". *In Below-Replacement Fertility in Industrial Societies: Causes, Consequences, Policies.* Kingsley D.; Bernstam M.; Ricardo-Campbell R. (eds.). *Population and Development Review*, Supplement to vol. 12. New York: Population Council, 203-216 .

Coelho, E.; Magalhaes, M.G.; Bravo, J.M. (2007). "Mortality and Longevity projections for the oldest-old in Portugal". *Working paper 10*. Proceedings of the Joint Eurostat/UNECE (United Nations Statistical Commission and Statistical Office of the Economic Commission for Europe). Accessed at: http://www.unece.org/stats/documents/ece/ces/ge.11/2007/wp.10.e.pdf

Coleman, D. (2007). "Demographic diversity and the ethnic consequences of immigration". Vienna Yearbook of Population Research 2007, 5-12.

Coleman, D. (2008). "The demographic effects of international migration in Europe". *Review of Economic Policy*,Vol. 24 (3), 452–476.

Goodkind, D. (1999). "Should prenatal sex selection be restricted? Ethical questions and their implications for research and policy". *Population Studies*, Vol. 53 (1), 49-61.

Grashaw, K. (2009). "Comparing and Contrasting Extrapolation with the Writing of Scenarios as Forecasting Techniques. Why is creative thinking using scenarios, extrapolation, brainstorming, the Delphi technique or statistical modeling helpful in the strategic management process?" Accepted at: http://www.grashaw.com/articles/Extrapolation_forecastingTechnique_022709.html

Green, K. C.; Armstrong, J. Sc. (2004). "Structured analogies for forecasting". *Monash Econometrics and Business Statistics Working Papers Vol. 17(04)*, Monash University, Department of Econometrics and Business Statistics. Retrieved from: http://www.buseco.monash.edu.au /ebs/pubs/wpapers/2004/wp17-04.pdf

Guegant, J. (2005). "The Proximate Determinants during the Fertility Transition." *In United Nations Report Completing the Fertility Transition. Retrieved from:*

http://www.un.org/esa/population/publications/completingfertility/2RevisedGUENGANTpaper.pdf

Heran, F.; Toulemont, L. (2005)"What happens when the census population figure does not math estimates?". Population and societies, No. 411, 1-4.

Higgins, M.; Williamson J. G. (1997). "Age structure dynamics in Asia and dependence on foreign Capital." *Population and Development Review, Vol.* 23, 261-93.

Das Gupta, M; Bhat (1997). "Gender Differences in Child Survival in India: What do we Know? ". *Development Review*, Vol. 13 (1), 77-100. Retrieved from http://iussp2005.princeton.edu/ download.aspx?submissionId=51398

Das Gupta, M.; Woojin Ch.; Li Sh. (2009). "Is There an Incipient Turnaround in Asia's 'Missing Girls' Phenomenon?". *World Bank Policy Research Working Paper 4846*. Retrieved from: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1354952

Demographic reports: The future population of Sweden 2009–2060. Statistics Sweden 2009.

Retrieved from: URN:NBN:SE:SCB-2009-BE51BR0901ENG_pdf (pdf)

Dorigo G.; Tobler, W. (1983). "Push-Pull Migration Laws". *Annals of the Association of American Geographers,* Vol. 73 (1), 1-17. Retrieved from: http://www.geog.ucsb.edu/~tobler/ publications /pdf_docs/movement/migration/PushPull.pdf

Durlauf, S.;Walker, J. (1999). "Social interactions and fertility transitions". *Prepared for the workshop on "Social Processes underlying fertility change in developing countries"*, January 28-30, 1998, organized by the Committee on Population, National Academy of Sciences, 1-35. Retrieved from: http://www.econ.wisc.edu/archive/wp9928.pdf

Dyson, T. (2001). "The Preliminary Demography of the 2001 Census of India". *Population and Development Review,* Vol.27 (2), 341–356.

Easterlin, R. A. (1966). "On the relation of economic factors to recent and projected fertility changes". *Demography*, Vol.3, 135-153.

Edlund, L. (1999). "Son preference, sex ratios and marriage patters". *Journal of Political. Economy*, Vol. 107(6), 1275-1304.

Fisher, R.A. (1930)."The Genetical Theory of natural selection". I*n Variorum edition*, Bennet, J. H. (ed.), Oxford University Press, Oxford,1999.

Foster, D. A.; Rosenzweig, R. M. (2001). "Missing women, the marriage market, and economic growth". *Brown University Working Paper*. Accepted at: http://adfdell.pstc.brown.edu /papers/sex.pdf

Frejka, T. (1981). "World population projections: A concise history". *In International Population Conference,* Vol. 3, IUSSP, Manila, Philippines.

Frejka, T. (1994). "Long-range global population projections: Lessons learned". In *The future population of the world: What can we assume today*? edited by Lutz. W., 3-15. London, UK: Earthscan Publications Ltd.

Harvey, A. C. (1989). "Forecasting structural time series models and the Kalman filter". Cambridge University Press, Cambridge, xvi + 554 pp.

Henry, L. (1987). Perspectives et previsions, in: Keilman, N. *Uncertainty in national population forecasting: issue, background, analyses, reccomendations*. Amsterdam, 1991.

International Organization for Migration. Ritrieved from: www.iom.int

IUSSP Multilingual Demographic Dictionary (not dated). United Nations. Department of Economic and Social Affairs. New York.

Johnson, P.; Falkingham, J. (1992). "Ageing and Economic Welfare". London: Sage.

Johnson, R.E. (1999). Survival models and data analysis, Wiley Classics Library Edition, published 1999.

Kelley, A.; Schmidt, R. (1995). "Aggregate Population and Economic Growth Correlations: The Role of the Components of Demographic Change". *Demography, Vol.* 32, 543-555.

Kelley, A. (2001). "The Population Debate in Historical Perspective: Revisionism Revised". *In Population Matters: Demography, Growth, and Poverty in the Developing World* edited by Birdsall, N.; Kelley, A.; Sinding, S. Oxford University Press, 24-54.

Keilman, N. (1990). "Uncertainty in population forecastin: issues, backgrounds, analyses, recommendations*". Swets & Zeitlinger*, Amsterdam.

Keilman, N; Kucera, T. (1991). "The impact of forecasting methodology on the accuracy of national population forecasts: evidence from the Netherlands and Czechoslovakia*". Journal of Forecasting*, Vol. 10(4), 371-98.

Keilman, N.; Cruijsen, H. (1992). "A comparative analysis of the forecasting process". In: Keilman,

N. and Cruijsen, H. (eds.), *National population forecasting in industrialized countries*, Amsterdam: Swets and Zeitlinger, 3-25.

Keilman, N; Pham D.; Hetland A. (2002) . "Why population forecasts should be probabilistic - illustrated by the case of Norway". Demographic Reseacherch, Vol,6 (15), 409-454.

Keyfitz, N. (1968). *"Introduction to the Mathematics of Population"*. Reading, MA: Addison-Wesley.

Keyfitz, N.(1977). "Applied mathematical demography". *New York* , Willey.

Keyfitz, N.(1981). "The limits of population forecating". *Population and Development review*, Vol. 7 (4), 579-593.

Keyfitz, N.(1982). "Can knowledge improve forecast". *Population and Development review*, Vol. 8 (4), 729-751.

Kinsella, K., (2000). "Demographic Dimensions of Global Aging", *Journal of Family Issues*, Vol. 21 (5), 541-558.

Klasen, St.; Wink, Cl. (2002). "A Turning Point in Gender Bias in Mortality? An update on the number of missing women". *Population and Development Review* 28 (2), 285–312.

Kim, Doo-Sub. (2003). "Changing trends and regional differences in sex ratio at birth in Korea". *Paper presented at the symposium on "Gender issues at early stages of life in South and East*

Asia", Pondicherry, November 2003.

Koryś, P.; Okólski, M. (2004). Czas globalnych migracji. Mobilność międzynarodowa w perspektywie globalizacji. Time of global migration. International mobility in the perspective of globalisation*. ISS Working Papers* "Prace Migracyjne" 55. Center for Migration Research, Warsaw.

Kritz, M.; Lim, L. L.; Zlotnik, H. (eds.) (1992). International migration systems: A global approach. *Clarendon Press*, Oxford.

Kuznets, S. (1960). "Population Change and aggregate output". *In Universities--National Bureau Committee for Economic Research, Demographic and Economic Change in Developed Countries.* Princeton: Princeton University Press.

Kuznets, S. (1967). "Population and Economic Growth". *Proceedings of the American Philosophical Society,*Vol. 111, 170-93.

Lee, R. D. (2003). "The demographic transition: Three centuries of fundamental change." *Journal of Economic Perspectives, Vol.* 17(4), 167-190.

Leff, N. H. (1969). "Dependency rates and saving rates." *American Economic Review*,Vol. 59, 886-895.

Leloup, F. (1996). "Migration, a complex phenomenon". *International Journal of Anthropology*, Vol. 11 (2-4), 101-115.

Leslie, P. H. (1945). On the Use of Matrices in Certain Population Mathematics. *Biometrika,Vol.*

33(3), 183–212.

Leslie, P. H. (*1948*). *"Some further notes on the use of matrices in population mathematics". Biometrika,* Vol. 35 , 213-245.

Lesthaeghe, R.; Surkyn, J. (1988). "Cultural Dynamics and Economic Theories of Fertility Change", *Population and Development Review*, Vol. 1.

Lesthaeghe, R. (2001). "Postponement and recuperation: Recent fertility trends and forecasts in six Western European countries", *IPD-WP 2001-1, Paper presented at the IUSSP Seminar on "International Perspectives on Low Fertility: Trends, Theories and Policies"*, Tokyo, March 21-23, 2001. IUSSP Working Group on Low Fertility and National Institute for Population and Social Security Research, Japan, 1-38. Retrieved from: http://www.vub.ac.be/soco/ron/Posp%20Recup %20Fert%20Tokyo%20seminar.pdf

Lesthaeghe, R.; Surkyn, J. (2004). "Value Orientations and the Second Demographic Transition (SDT) in Northern, Western and Southern Europe: An Update", *Demographic Research, Max Planck Institute for Demographic Research*, Rostock, April 17, 2004, Special Collection 3, No. 3, 45-86

Lewis, A. W. (1954). "Economic development with unlimited supplies of labour". *School of Economic and Social Studies,* Manchester.

Lewis, W.A. (1955). "Theory of Economic Growth". London: Allen & Unwin.

Lindh, T.; Malmberg, B. (1999). "Age structure effects and growth in the OECD, 1950-1990". *Journal of Population Economics,* Vol.12, 431-449.

Long, F. J. (1992). "Accuracy, monitoring, and evaluation of national population projections" In Nationak Population Forecasting in Industrialized Countries edited Keilman, N.; Cruijsen, H, 129-142.

Lutz, W. (ed.), (1996). "The Future Population of the World: What Can We Assume Today?". Retrieved from: http://www.iiasa.ac.at/Admin/PUB/Documents/XB-96-003.pdf

Lutz, W.; Sanderson, C.W.; Scherbov, S. (eds.), (2004)."The End of World Population Growth in the 21st Century: New Challenges for Human Capital Formation and Sustainable Development". London: Earthscan, 500pp.

Malmberg, B.; Lindh. T. (2004). "Demographically based global income forecasts up to the year 2050". *Institute for Futures Studies,* Stockholm.

M.Mammadova, M.; Mammadov,V; Guliyeva,N; Rahimova, Z. (2007). Demographicheskoe razvitie v Azerbaijane, Baku. 2005.

Massey, D.S.; Joaquim, A.; Hugo, G.; Kouaouci, A.; Pellerino, A.; Taylor, J.E. (1993). "Theories of international migration: a review and appraisal", *Population and Development Review*, Vol. 19 (3), 431-466. Retrieved from: http://www.scribd.com/doc/20270500/Massey-Et-Al-Theories-of-International-Migration-A-Review-and-Appraisal

Mason, A. (1988). "Saving, economic growth, and demographic change." *Population and Development Review*, Vol. 14(1), 113-144.

Mason, A. (ed.), (2001). "Population Change and Economic Development in East Asia: Challenges Met, Opportunities Seized". *Stanford University Press*. Stanford.

Mason, A. (2005). "Demographic transition and demographic dividends in developed and developing countries". *United Nations expert group meeting on social and economic implications of changing population age structure. Population Division Department of Economic and Social Affairs United Nations Secretariat*, Mexico City, 31 August – 2 September, 2005. Retrieved from: http://www2.hawaii.edu/~amason/Research/UN%20Demog%20Transition.pdf

McMillan, H. M.; Baesel, J. B. (1990). "The macroeconomic impact of the baby boom generation." *Journal of Macroeconomics,* Vol. 12(2), 167-195.

Measurement of Population According to Composition. (1993). *In readings in population research Methodology,* Vol. 1. Basic Tools / D. J. Bogue, E.A. Arriaga, and D.L. Anderton (ed.). Chicago, 1993.

Mesle, F.; Vallin, J.; Badurashvili, I. (2004). "A sharp increase in sex ratio at birth in the Caucasus. Why? How?". *Paper presented at the annual meetings of the Population Association of America*, Boston, April 2004.

Migration in the Republic of Azerbaijan: A Country Profile, 2008. (2008). Retrieved from: http://publications.iom.int/bookstore/free/Azerbaijan_Profile2008.pdf

Migration perspectives: Eastern Europe and Central Asia, (2006). IOM, 2006. Retrieved from: http://iom.ramdisk.net/iom/images/uploads/Website%20version%20Migration%20Perspectives% 20 eng%20protected_1169046292.pdf

Multiple Indicator Cluster Survey – 2000, Reproductive Health Survey – 2001, Demographic and Health Survey – 2006

Nagel, E. (1961). "The Structure of Science: Problems in the Logic of Scientific Explanation". *Hackett Publishing Company*. Indianapolis-Cambridge. Retrieved from: http://books.google.com/books?id=u6EycHgRfkQC&printsec=frontcover&dq=inauthor:%22Ernest+Nagel%22&ei=ZKJ2S-SXG6PmygSnjIGrBA&cd=1#v=onepage&q=&f=false

Narodonaselenie. Enciklopedicjeskiy slovar. (1994) /Melikyan G.G. (eds.). Moskva,1994, p.640

National Population Projections 2006–based Population projections by age and sex for the United Kingdom, Great Britain and constituent countries *Series PP2,* No. 26, edited by Helen Bray, Office for National Statistics

Notestein, F.W. (1945). Population: The long view. In *Food for the World* edited by Schultz, T.W., University of Chicago Press, Chicago, IL, USA, 36-69.

Olshansky, S.J.; Ault, B. (1986). "The Fourth Stage of the Epidemiologic Transition: The Age of Delayed Degenerative Diseases". *The Milbank Quarterly*, Vol. 64(3), 355-391.

Omran, A. R. (1971). "The Epidemiologic Transition: A Theory of the Epidemiology of Population Change**".** Retrieved from: http://www.milbank.org/quarterly/830418omran.pdf

O'Nelli, B.C.; Scherbov, S.;Lutz, W. (1999). "The long-term effect of the timing of fertility decline on population size". *Population and Development Review, Vol.* 25 (4), 749-756.

O'Nelli B.C.; Balk, D.; Brickman M.; Ezra M., A. (2001). "Guide to Global Population Projections", *Demographic Research*, Vol. 4, Article 8, Max-Planck-Gesellschaft, 203-288.

Palmore J.A.; Gardner R.W. (1983). "Measuring Mortality, Fertility and Natural Increase: A Self-Teaching Guide to Elementary Measures". Hawaii, The east-west center.

Peller S. (1948). "Mortality, Past and Future". *Population Studies*, Vol. 1(4), 405-456.

Pison, G. (2004). "Fewer birth, but a boy at all costs: selective female abortion in Asia". *Population and Societies*, N 404, 1-4.

Pollard. J. H. (1982). In Vallin, J.; Caselli, G. *Relationship between age-specific rates and synthetic indicators: decomposition of a difference, Demography: Analysis and Synthesis*, 2006.

Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, *World Population Prospects: the 2008 Revision*. Retrieved from: http://esa.un.org/unpp

Prskawetz, A.; T. Lindh, (eds.).(2006). "The impact of ageing on innovation and productivity growth in Europe*." Research Report* 28, Vienna Institute of Demography, Austrian Academy of Sciences.

Ravenstein, E. (1876). "The birthplaces of the people and the laws of migration". *The Geographical Magazine,* Vol. 3,173-77, 201-6, 229-33.

Ravenstein, E. (1885). "The laws of migration". *Journal of the Statistical Society*, Vol.48,167-235

Ravenstein, E. (1889). "The laws of migration: second paper". *Journal of the Royal Statistical Society* , Vol.52, 241-305.

Recommended citation: State Statistical Committee (SSC) [Azerbaijan] and Macro International Inc. 2008. Azerbaijan Demographic and Health Survey 2006. Calverton, Maryland, USA: State Statistical Committee and Macro International Inc.

Rogers, A. (1975). "Introduction to Multi-Regional Mathematical Demography". New York.

Rogers A, (1980). "Introduction to multistate mathematical demography", *Environment and Planning*, Vol. 12(5), 489 – 498.

Ryder B. N. (1965). "The cohort as a concept in the Study of social change". *American Sociological Review*, Vol.30 (6), 843-861.

Skirbekk, V. (2004). "Age and individual productivity: A literature survey." *Vienna Yearbook of Population Research* ,2004, 133-154.

Simon, J. (1981). "The Ultimate Resource". *Princeton University Press*, Princeton.

Sobotka, T. (2004). "Postponement of Childbearing and Low Fertility in Europe". *Dutch University Press*, Amsterdam. Retrieved from: http://dissertations.ub.rug.nl/FILES/faculties/rw/2004/t.sobotka /titlecon.pdf

Solow, R. M. (1956). "A contribution to the theory of economic growth." *The Quarterly Journal of Economics*, Vol. 70(1), 65-94.

State Statistical Committee of the Republic of Azerbaijan. Retrieved from: http://azstat.org

Study on transit migration through Azerbaijan. (2004). Retrieved from: http://www.docstoc.com/docs/2375571/STUDY-ON-TRANSIT-MIGRATION-THROUGH-AZERBAIJAN

Thatcher, R.; Kannistö, V.; Vaupel, J. W. (1998). "The Force of Mortality at Ages 80 to 120". *Odense Monographs on Population Aging* 5. Odense University Press, Retrieved from: http://www.demogr.mpg.de/Papers/Books/Monograph5/start.htm

Thatcher, R., (1999). "The long-term pattern of adult mortality and the highest attained age" *Journal of the royal statistical society series A*, Royal Statistical Society, Vol. 162(1), 5-43.

UNICEF notes progress in reducing childhood mortality in Azerbaijan. Retrieved from: http://www.unicef.org/azerbaijan/media_9707.html

United Nations Organization. Retrieved from: http://www.un.org/

Van de Kaa, D.J.(1987). "Europe's Second Demographic Transition", *Population Bulletin,* Vol. 42 (1), 1-62.

Van de Kaa, D.J. (2003). "Second Demographic Transition". In *Encyclopedia of Population, Macmillan Reference USA* edited by Demeny, P.; McNicoll, G. (2003) Thomson-Gale, New York. Vol. 2, 872-875.

Waldron, I. (1998). "Factors determining the sex ratio at birth". *In Too Young to Die: Genes or Gender?* United Nations, New York, 53-63.

Whelpton, P.K. (1936). "An empirical method of calculating future population". *Journal of the American Statistical Association* 31, 457-473.

World Factbook. Retrieved from: https://www.cia.gov/library/publications/the-world-factbook/index.html

World Health Organization http://www.who.int/research/en/

Zeng, Yi.; Vaupel, W. J. (2003). "Oldest Old Mortality in China". *Demographic Research*, Vol. 8 (7), 215-244.

Zeng, Yi.; Poston, D.; Vlosky, D.; Gu, D. (2008). "Healthy longevity in China". *Springer Series on Demographic Methods and Population Analysis 20*. Retrieved from: http://books.google.com/books?id=vSntSIrMkTsC&printsec=frontcover&source=gbs_navlinks_s#v=onepage&q=&f=false

APPENDICES

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Population forecast, Azerbaijan, 2008–2050, medium variant, males, abridged age structure (as of 31.12. of a given year)

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
0	81 808	83 359	83 661	71 781	63 289	65 277	68 220	59 041
1–4	305 480	323 940	338 231	312 764	264 616	254 128	276 385	242 494
5–9	299 440	321 508	405 784	420 458	383 369	327 002	337 214	325 293
10–14	366 002	319 977	320 758	404 866	419 572	382 638	318 091	343 346
15–19	468 799	441 947	319 340	320 185	404 105	418 815	325 987	336 274
20–24	456 910	474 398	440 444	318 433	319 338	402 944	380 992	316 970
25–29	376 101	411 430	471 835	438 193	317 049	318 046	415 842	324 045
30–34	307 345	330 311	408 375	468 418	435 240	315 262	398 949	377 558
35–39	291 746	284 653	327 883	405 274	464 899	432 269	314 907	411 448
40–44	313 924	307 146	282 250	325 122	401 686	460 750	311 849	394 363
45–49	323 561	319 591	301 910	277 945	320 318	395 744	422 884	309 927
50–54	244 408	285 269	309 639	293 161	270 436	312 031	442 895	301 461
55–59	150 194	174 033	269 708	293 486	278 822	257 931	369 468	396 631
60–64	81 269	110 243	159 113	247 899	270 858	258 472	278 557	398 890
65–69	76 474	55 762	96 736	140 594	220 565	242 099	216 806	315 436
70–74	87 019	86 785	45 294	80 276	117 778	186 398	198 991	219 715
75–79	50 345	51 818	62 897	33 399	61 085	90 721	161 708	150 259
80–84	22 330	28 298	31 567	39 259	21 312	40 687	100 078	112 021
85–89	6 422	7 214	13 299	15 420	19 792	11 023	34 374	65 603
90–94	2 100	2 047	2 305	4 603	5 591	7 430	9 267	25 360
95–99	822	485	406	500	1 086	1 381	1 139	4 408
100+	471	294	78	62	79	174	345	536
Total	**4 312 970**	**4 420 507**	**4 691 515**	**4 912 099**	**5 060 884**	**5 181 221**	**5 384 947**	**5 431 078**
Index (2008=100%)								
0	100.0	101.9	102.3	87.7	77.4	79.8	83.4	72.2
1–4	100.0	106.0	110.7	102.4	86.6	83.2	90.5	79.4
5–9	100.0	107.4	135.5	140.4	128.0	109.2	112.6	108.6
10–14	100.0	87.4	87.6	110.6	114.6	104.5	86.9	93.8
15–19	100.0	94.3	68.1	68.3	86.2	89.3	69.5	71.7
20–24	100.0	103.8	96.4	69.7	69.9	88.2	83.4	69.4
25–29	100.0	109.4	125.5	116.5	84.3	84.6	110.6	86.2
30–34	100.0	107.5	132.9	152.4	141.6	102.6	129.8	122.8
35–39	100.0	97.6	112.4	138.9	159.4	148.2	107.9	141.0
40–44	100.0	97.8	89.9	103.6	128.0	146.8	99.3	125.6
45–49	100.0	98.8	93.3	85.9	99.0	122.3	130.7	95.8
50–54	100.0	116.7	126.7	119.9	110.6	127.7	181.2	123.3
55–59	100.0	115.9	179.6	195.4	185.6	171.7	246.0	264.1
60–64	100.0	135.7	195.8	305.0	333.3	318.0	342.8	490.8
65–69	100.0	72.9	126.5	183.8	288.4	316.6	283.5	412.5
70–74	100.0	99.7	52.1	92.3	135.3	214.2	228.7	252.5
75–79	100.0	102.9	124.9	66.3	121.3	180.2	321.2	298.5
80–84	100.0	126.7	141.4	175.8	95.4	182.2	448.2	501.7
85–89	100.0	112.3	207.1	240.1	308.2	171.6	535.3	1021.5
90–94	100.0	97.5	109.7	219.2	266.3	353.8	441.3	1207.6
95–99	100.0	59.0	49.4	60.9	132.1	168.0	138.6	536.2
100+	100.0	62.5	16.7	13.2	16.7	36.9	73.2	113.7
Total	**100.0**	**102.5**	**108.8**	**113.9**	**117.3**	**120.1**	**124.9**	**125.9**

Population forecast, Azerbaijan, 2008–2050, medium variant, males, age groups

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
0-14	1 052 730	1 048 784	1 148 434	1 209 869	1 130 846	1 029 045	999 910	970 174
15-59	2 932 988	3 028 777	3 131 386	3 140 218	3 211 892	3 313 792	3 383 772	3 168 676
60+	327 252	342 946	411 695	562 013	718 145	838 383	1 001 266	1 292 228
Total	**4 312 970**	**4 420 507**	**4 691 515**	**4 912 099**	**5 060 884**	**5 181 221**	**5 384 947**	**5 431 078**
Relative structure (in per cent)								
0-14	24.4	23.7	24.5	24.6	22.3	19.9	18.6	17.9
15-59	68.0	68.5	66.7	63.9	63.5	64.0	62.8	58.3
60+	7.6	7.8	8.8	11.4	14.2	16.2	18.6	23.8
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Index (2008=100%)								
0-14	100.0	99.6	109.1	114.9	107.4	97.8	95.0	92.2
15-59	100.0	103.3	106.8	107.1	109.5	113.0	115.4	108.0
60+	100.0	104.8	125.8	171.7	219.4	256.2	306.0	394.9
Total	**100.0**	**102.5**	**108.8**	**113.9**	**117.3**	**120.1**	**124.9**	**125.9**

Population forecast, Azerbaijan, 2008–2050, medium variant, males, children and youth

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
0–2	242 476	246 931	253 168	223 307	192 190	193 350	206 169	178 710
3–5	205 232	235 229	251 684	244 534	207 215	189 120	207 251	185 735
6–10	296 340	307 764	397 472	419 899	394 961	335 279	333 340	330 297
11–14	308 682	258 859	246 110	322 128	336 480	311 297	253 150	275 432
15–18	373 084	348 823	243 934	262 270	325 658	335 365	257 406	270 623
19–23	466 564	474 244	423 085	301 198	340 036	408 200	368 659	320 183
Index (2008=100%)								
0–2	100.0	101.8	104.4	92.1	79.3	79.7	85.0	73.7
3–5	100.0	114.6	122.6	119.2	101.0	92.1	101.0	90.5
6–10	100.0	103.9	134.1	141.7	133.3	113.1	112.5	111.5
11–14	100.0	83.9	79.7	104.4	109.0	100.8	82.0	89.2
15–18	100.0	93.5	65.4	70.3	87.3	89.9	69.0	72.5
19–23	100.0	101.6	90.7	64.6	72.9	87.5	79.0	68.6

Population forecast, Azerbaijan, 2008–2050, medium variant, males, elderly population

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
65+	245 983	232 702	252 582	314 114	447 287	579 912	722 709	893 338
75+	82 490	90 156	110 552	93 244	108 945	151 415	306 912	358 187
85+	9 815	10 040	16 088	20 586	26 548	20 007	45 125	95 907
Index (2008=100%)								
65+	100.0	94.6	102.7	127.7	181.8	235.8	293.8	363.2
75+	100.0	109.3	134.0	113.0	132.1	183.6	372.1	434.2
85+	100.0	102.3	163.9	209.7	270.5	203.8	459.8	977.1

Population forecast, Azerbaijan, 2008–2050, medium variant, males, average age

Age	2008	2010	2015	2020	2025	2030	2040	2050
Average	30.31	30.70	31.69	32.97	34.59	36.14	38.39	40.25

Population forecast, Azerbaijan, 2008–2050, medium variant, females, abridged age structure (as of 31.12. of a given year)

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
0	70 278	72 501	72 759	62 427	55 043	56 776	59 340	51 359
1–4	261 949	278 674	294 243	272 071	230 182	221 070	240 451	210 971
5–9	258 085	275 539	350 105	365 974	333 655	284 584	293 483	283 106
10–14	334 484	285 579	275 121	349 560	365 433	333 215	276 980	298 955
15–19	444 524	415 364	285 348	274 947	349 257	365 125	284 151	293 088
20–24	437 486	452 491	414 483	284 955	274 648	348 735	332 556	276 680
25–29	371 925	396 545	450 726	412 977	284 176	273 972	363 532	283 273
30–34	330 203	345 552	395 067	449 020	411 535	283 463	346 766	330 863
35–39	326 877	316 995	344 158	393 436	447 144	409 967	272 722	361 483
40–44	354 780	347 324	315 499	342 573	391 596	445 036	281 886	344 651
45–49	355 836	358 740	344 617	313 245	340 209	388 926	405 582	270 679
50–54	264 894	311 760	353 426	339 806	309 143	335 960	436 812	277 438
55–59	166 865	194 361	303 747	344 684	331 865	302 314	376 504	393 428
60–64	95 085	127 524	185 767	291 037	330 865	319 283	317 666	414 871
65–69	97 689	70 883	118 161	172 838	271 938	310 095	275 004	345 747
70–74	119 426	121 002	61 780	104 617	154 048	244 004	272 111	275 273
75–79	69 189	73 182	96 130	49 620	86 110	128 060	236 012	214 952
80–84	36 668	44 031	50 275	66 879	35 014	63 006	153 855	177 576
85–89	13 260	14 063	23 973	28 065	37 894	20 164	58 413	113 035
90–94	4 791	5 562	5 352	9 550	11 472	15 690	17 097	44 875
95–99	2 371	1 287	1 324	1 296	2 427	2 966	2 218	7 637
100+	666	762	226	201	193	357	611	754
Total	**4 417 331**	**4 509 720**	**4 742 285**	**4 929 779**	**5 053 846**	**5 152 767**	**5 303 751**	**5 270 693**
Index (2008=100%)								
0	100.0	103.2	103.5	88.8	78.3	80.8	84.4	73.1
1–4	100.0	106.4	112.3	103.9	87.9	84.4	91.8	80.5
5–9	100.0	106.8	135.7	141.8	129.3	110.3	113.7	109.7
10–14	100.0	85.4	82.3	104.5	109.3	99.6	82.8	89.4
15–19	100.0	93.4	64.2	61.9	78.6	82.1	63.9	65.9
20–24	100.0	103.4	94.7	65.1	62.8	79.7	76.0	63.2
25–29	100.0	106.6	121.2	111.0	76.4	73.7	97.7	76.2
30–34	100.0	104.6	119.6	136.0	124.6	85.8	105.0	100.2
35–39	100.0	97.0	105.3	120.4	136.8	125.4	83.4	110.6
40–44	100.0	97.9	88.9	96.6	110.4	125.4	79.5	97.1
45–49	100.0	100.8	96.8	88.0	95.6	109.3	114.0	76.1
50–54	100.0	117.7	133.4	128.3	116.7	126.8	164.9	104.7
55–59	100.0	116.5	182.0	206.6	198.9	181.2	225.6	235.8
60–64	100.0	134.1	195.4	306.1	348.0	335.8	334.1	436.3
65–69	100.0	72.6	121.0	176.9	278.4	317.4	281.5	353.9
70–74	100.0	101.3	51.7	87.6	129.0	204.3	227.8	230.5
75–79	100.0	105.8	138.9	71.7	124.5	185.1	341.1	310.7
80–84	100.0	120.1	137.1	182.4	95.5	171.8	419.6	484.3
85–89	100.0	106.1	180.8	211.7	285.8	152.1	440.5	852.5
90–94	100.0	116.1	111.7	199.3	239.5	327.5	356.9	936.7
95–99	100.0	54.3	55.9	54.7	102.4	125.1	93.5	322.1
100+	100.0	114.4	33.9	30.1	29.0	53.7	91.7	113.1
Total	**100.0**	**102.1**	**107.4**	**111.6**	**114.4**	**116.6**	**120.1**	**119.3**

Population forecast, Azerbaijan, 2008–2050, medium variant, females, age groups

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
0-14	924 796	912 293	992 228	1 050 031	984 314	895 645	870 255	844 391
15-59	3 053 390	3 139 132	3 207 070	3 155 645	3 139 571	3 153 498	3 100 511	2 831 583
60+	439 145	458 295	542 987	724 103	929 961	1 103 625	1 332 986	1 594 719
Total	**4 417 331**	**4509720**	**4742285**	**4929779**	**5053846**	**5152767**	**5303751**	**5270693**
Relative structure (in per cent)								
0-14	20.9	20.2	20.9	21.3	19.5	17.4	16.4	16.0
15-59	69.1	69.6	67.6	64.0	62.1	61.2	58.5	53.7
60+	9.9	10.2	11.4	14.7	18.4	21.4	25.1	30.3
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Index (2008=100%)								
0-14	100.0	98.6	107.3	113.5	106.4	96.8	94.1	91.3
15-59	100.0	102.8	105.0	103.3	102.8	103.3	101.5	92.7
60+	100.0	104.4	123.6	164.9	211.8	251.3	303.5	363.1
Total	**100.0**	**102.1**	**107.4**	**111.6**	**114.4**	**116.6**	**120.1**	**119.3**

Population forecast, Azerbaijan, 2008–2050, medium variant, females, children and youth

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
0–2	207 745	213 919	220 197	194 221	167 157	168 177	179 342	155 464
3–5	176 050	201 887	219 002	212 757	180 279	164 541	180 329	161 610
6–10	257 664	264 140	342 409	365 550	343 793	291 823	290 139	287 484
11–14	283 337	232 347	210 621	277 503	293 084	271 104	220 444	239 834
15–18	354 141	326 541	215 789	225 287	281 810	292 317	224 331	235 829
19–23	445 671	452 008	395 482	265 222	292 513	354 240	321 722	279 413
Index (2008=100%)								
0–2	100.0	103.0	106.0	93.5	80.5	81.0	86.3	74.8
3–5	100.0	114.7	124.4	120.9	102.4	93.5	102.4	91.8
6–10	100.0	102.5	132.9	141.9	133.4	113.3	112.6	111.6
11–14	100.0	82.0	74.3	97.9	103.4	95.7	77.8	84.6
15–18	100.0	92.2	60.9	63.6	79.6	82.5	63.3	66.6
19–23	100.0	101.4	88.7	59.5	65.6	79.5	72.2	62.7

Population forecast, Azerbaijan, 2008–2050, medium variant, females, elderly population

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
65+	344 060	330 771	357 220	433 066	599 096	784 342	1 015 320	1 179 848
75+	126 945	138 886	177 279	155 611	173 111	230 242	468 205	558 828
85+	21 088	21 673	30 875	39 112	51 987	39 177	78 338	166 300
Index (2008=100%)								
65+	100.0	96.1	103.8	125.9	174.1	228.0	295.1	342.9
75+	100.0	109.4	139.7	122.6	136.4	181.4	368.8	440.2
85+	100.0	102.8	146.4	185.5	246.5	185.8	371.5	788.6

Population forecast, Azerbaijan, 2008–2050, medium variant, females, average age

Age	2008	2010	2015	2020	2025	2030	2040	2050
Average	32.72	33.22	34.46	35.92	37.67	39.36	41.86	43.60

Population forecast, Azerbaijan, 2008–2050, medium variant, total, abridged age structure (as of 31.12. of a given year)

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
0	152 086	155 860	156 420	134 208	118 332	122 054	127 560	110 400
1–4	567 429	602 615	632 475	584 835	494 798	475 197	516 837	453 465
5–9	557 525	597 047	755 888	786 432	717 025	611 586	630 697	608 399
10–14	700 486	605 556	595 879	754 425	785 004	715 853	595 071	642 301
15–19	913 323	857 311	604 688	595 132	753 361	783 940	610 137	629 362
20–24	894 396	926 889	854 927	603 388	593 986	751 679	713 548	593 650
25–29	748 026	807 975	922 561	851 170	601 225	592 017	779 374	607 318
30–34	637 548	675 863	803 442	917 439	846 775	598 725	745 715	708 420
35–39	618 623	601 647	672 041	798 710	912 042	842 235	587 629	772 931
40–44	668 704	654 470	597 750	667 695	793 282	905 787	593 735	739 013
45–49	679 397	678 331	646 527	591 191	660 527	784 671	828 466	580 606
50–54	509 302	597 029	663 065	632 967	579 579	647 991	879 707	578 899
55–59	317 059	368 394	573 455	638 171	610 687	560 246	745 972	790 059
60–64	176 354	237 767	344 880	538 936	601 723	577 755	596 223	813 761
65–69	174 163	126 645	214 897	313 432	492 503	552 195	491 810	661 182
70–74	206 445	207 786	107 074	184 893	271 826	430 402	471 102	494 989
75–79	119 534	125 001	159 027	83 019	147 194	218 781	397 721	365 211
80–84	58 998	72 329	81 842	106 138	56 326	103 693	253 933	289 597
85–89	19 682	21 277	37 271	43 486	57 686	31 186	92 787	178 638
90–94	6 891	7 609	7 657	14 153	17 064	23 120	26 364	70 235
95–99	3 193	1 772	1 731	1 797	3 513	4 346	3 357	12 045
100+	1 137	1 056	304	263	272	531	955	1 289
Total	**8 730 301**	**8 930 227**	**9 433 800**	**9 841 878**	**10 114 730**	**10 333 988**	**10 688 698**	**10 701 771**
Index (2008=100%)								
0	100.0	102.5	102.9	88.2	77.8	80.3	83.9	72.6
1–4	100.0	106.2	111.5	103.1	87.2	83.7	91.1	79.9
5–9	100.0	107.1	135.6	141.1	128.6	109.7	113.1	109.1
10–14	100.0	86.4	85.1	107.7	112.1	102.2	85.0	91.7
15–19	100.0	93.9	66.2	65.2	82.5	85.8	66.8	68.9
20–24	100.0	103.6	95.6	67.5	66.4	84.0	79.8	66.4
25–29	100.0	108.0	123.3	113.8	80.4	79.1	104.2	81.2
30–34	100.0	106.0	126.0	143.9	132.8	93.9	117.0	111.1
35–39	100.0	97.3	108.6	129.1	147.4	136.1	95.0	124.9
40–44	100.0	97.9	89.4	99.8	118.6	135.5	88.8	110.5
45–49	100.0	99.8	95.2	87.0	97.2	115.5	121.9	85.5
50–54	100.0	117.2	130.2	124.3	113.8	127.2	172.7	113.7
55–59	100.0	116.2	180.9	201.3	192.6	176.7	235.3	249.2
60–64	100.0	134.8	195.6	305.6	341.2	327.6	338.1	461.4
65–69	100.0	72.7	123.4	180.0	282.8	317.1	282.4	379.6
70–74	100.0	100.6	51.9	89.6	131.7	208.5	228.2	239.8
75–79	100.0	104.6	133.0	69.5	123.1	183.0	332.7	305.5
80–84	100.0	122.6	138.7	179.9	95.5	175.8	430.4	490.9
85–89	100.0	108.1	189.4	220.9	293.1	158.5	471.4	907.6
90–94	100.0	110.4	111.1	205.4	247.6	335.5	382.6	1019.2
95–99	100.0	55.5	54.2	56.3	110.0	136.1	105.1	377.2
100+	100.0	92.9	26.7	23.1	23.9	46.7	84.0	113.4
Total	**100.0**	**102.3**	**108.1**	**112.7**	**115.9**	**118.4**	**122.4**	**122.6**

Population forecast, Azerbaijan, 2008–2050, medium variant, total, age groups

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
0-14	1 977 526	1 961 077	2 140 662	2 259 900	2 115 160	1 924 690	1 870 164	1 814 565
15-59	5 986 378	6 167 910	6 338 455	6 295 863	6 351 464	6 467 290	6 484 282	6 000 259
60+	766 397	801 241	954 682	1 286 116	1 648 107	1 942 008	2 334 252	2 886 947
Total	**8 730 301**	**8 930 227**	**9 433 800**	**9 841 878**	**10 114 730**	**10 333 988**	**10 688 698**	**10 701 771**
Relative structure (in per cent)								
0-14	22.7	22.0	22.7	23.0	20.9	18.6	17.5	17.0
15-59	68.6	69.1	67.2	64.0	62.8	62.6	60.7	56.1
60+	8.8	9.0	10.1	13.1	16.3	18.8	21.8	27.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Index (2008=100%)								
0-14	100.0	99.2	108.2	114.3	107.0	97.3	94.6	91.8
15-59	100.0	103.0	105.9	105.2	106.1	108.0	108.3	100.2
60+	100.0	104.5	124.6	167.8	215.0	253.4	304.6	376.7
Total	**100.0**	**102.3**	**108.1**	**112.7**	**115.9**	**118.4**	**122.4**	**122.6**

Population forecast, Azerbaijan, 2008–2050, medium variant, total, children and youth

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
0–2	450 221	460 850	473 365	417 528	359 348	361 527	385 511	334 173
3–5	381 282	437 117	470 686	457 292	387 494	353 661	387 580	347 345
6–10	554 004	571 904	739 880	785 449	738 754	627 102	623 480	617 781
11–14	592 019	491 206	456 731	599 631	629 564	582 401	473 594	515 266
15–18	727 225	675 364	459 724	487 557	607 468	627 682	481 737	506 452
19–23	912 235	926 252	818 567	566 420	632 549	762 440	690 380	599 596
Index (2008=100%)								
0–2	100.0	102.4	105.1	92.7	79.8	80.3	85.6	74.2
3–5	100.0	114.6	123.4	119.9	101.6	92.8	101.7	91.1
6–10	100.0	103.2	133.6	141.8	133.3	113.2	112.5	111.5
11–14	100.0	83.0	77.1	101.3	106.3	98.4	80.0	87.0
15–18	100.0	92.9	63.2	67.0	83.5	86.3	66.2	69.6
19–23	100.0	101.5	89.7	62.1	69.3	83.6	75.7	65.7

Population forecast, Azerbaijan, 2008–2050, medium variant, total, elderly population

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
					1 046	1 364	1 738	2 073
65+	590 043	563 474	609 802	747 179	384	253	029	186
75+	209 435	229 042	287 831	248 855	282 056	381 657	775 117	917 015
85+	30 903	31 713	46 963	59 698	78 535	59 183	123 463	262 207
Index (2008=100%)								
65+	100.0	95.5	103.3	126.6	177.3	231.2	294.6	351.4
75+	100.0	109.4	137.4	118.8	134.7	182.2	370.1	437.9
85+	100.0	102.6	152.0	193.2	254.1	191.5	399.5	848.5

Population forecast, Azerbaijan, 2008–2050, medium variant, total, average age

Age	2008	2010	2015	2020	2025	2030	2040	2050
Average	31.53	31.98	33.09	34.45	36.13	37.74	40.12	41.90

Population forecast, Azerbaijan, 2008–2050, low variant, males, abridged age structure (as of 31.12. of a given year)

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
0	81 808	83 121	83 305	70 741	61 791	62 543	62 093	51 622
1–4	305 480	323 783	337 879	309 531	259 554	245 864	254 271	214 242
5–9	299 440	321 468	405 075	419 346	378 682	320 041	317 426	292 080
10–14	366 002	319 942	320 464	403 797	418 058	377 552	306 309	314 287
15–19	468 799	441 907	319 072	319 597	402 679	416 905	318 296	315 751
20–24	456 910	474 341	440 057	317 800	318 368	401 061	375 051	304 419
25–29	376 101	411 330	471 097	437 043	315 755	316 381	412 534	315 141
30–34	307 345	330 191	407 375	466 502	432 879	312 907	394 846	369 365
35–39	291 746	284 513	326 720	402 823	461 297	428 159	310 535	404 666
40–44	313 924	306 978	280 969	322 361	397 331	454 922	305 987	385 928
45–49	323 561	319 436	300 705	275 275	315 901	389 315	413 993	301 315
50–54	244 408	285 110	308 536	290 649	266 334	305 832	431 727	291 151
55–59	150 194	173 871	268 418	290 552	274 170	251 575	356 901	380 033
60–64	81 269	110 096	157 955	244 376	264 846	250 456	265 235	375 867
65–69	76 474	55 648	95 736	137 663	213 641	231 788	202 540	289 730
70–74	87 019	86 526	44 559	77 827	112 286	174 953	180 859	194 036
75–79	50 345	51 581	61 421	31 766	56 818	82 325	140 192	124 823
80–84	22 330	28 101	30 448	36 461	18 952	35 078	80 679	84 829
85–89	6 422	7 137	12 601	13 806	16 653	8 703	24 763	43 121
90–94	2 100	2 015	2 126	3 921	4 352	5 290	5 720	13 756
95–99	822	474	362	397	767	862	565	1 856
100+	471	287	67	45	49	93	136	166
Total	**4 312 970**	**4 417 856**	**4 674 946**	**4 872 276**	**4 991 163**	**5 072 605**	**5 160 658**	**5 068 184**
Index (2008=100%)								
0	100.0	101.6	101.8	86.5	75.5	76.5	75.9	63.1
1–4	100.0	106.0	110.6	101.3	85.0	80.5	83.2	70.1
5–9	100.0	107.4	135.3	140.0	126.5	106.9	106.0	97.5
10–14	100.0	87.4	87.6	110.3	114.2	103.2	83.7	85.9
15–19	100.0	94.3	68.1	68.2	85.9	88.9	67.9	67.4
20–24	100.0	103.8	96.3	69.6	69.7	87.8	82.1	66.6
25–29	100.0	109.4	125.3	116.2	84.0	84.1	109.7	83.8
30–34	100.0	107.4	132.5	151.8	140.8	101.8	128.5	120.2
35–39	100.0	97.5	112.0	138.1	158.1	146.8	106.4	138.7
40–44	100.0	97.8	89.5	102.7	126.6	144.9	97.5	122.9
45–49	100.0	98.7	92.9	85.1	97.6	120.3	127.9	93.1
50–54	100.0	116.7	126.2	118.9	109.0	125.1	176.6	119.1
55–59	100.0	115.8	178.7	193.5	182.5	167.5	237.6	253.0
60–64	100.0	135.5	194.4	300.7	325.9	308.2	326.4	462.5
65–69	100.0	72.8	125.2	180.0	279.4	303.1	264.8	378.9
70–74	100.0	99.4	51.2	89.4	129.0	201.1	207.8	223.0
75–79	100.0	102.5	122.0	63.1	112.9	163.5	278.5	247.9
80–84	100.0	125.8	136.4	163.3	84.9	157.1	361.3	379.9
85–89	100.0	111.1	196.2	215.0	259.3	135.5	385.6	671.5
90–94	100.0	96.0	101.2	186.7	207.2	251.9	272.4	655.0
95–99	100.0	57.7	44.0	48.3	93.3	104.8	68.8	225.8
100+	100.0	60.9	14.3	9.5	10.3	19.8	28.8	35.3
Total	**100.0**	**102.4**	**108.4**	**113.0**	**115.7**	**117.6**	**119.7**	**117.5**

Population forecast, Azerbaijan, 2008–2050, low variant, males, age groups

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
0-14	1 052 730	1 048 314	1 146 723	1 203 415	1 118 085	1 006 000	940 099	872 230
15-59	2 93 2988	3 027 676	312 2947	3 122 601	3 184 714	3 277 057	3 319 871	3 067 770
60+	327 252	341 865	40 5275	546 261	688 364	789 548	900 688	1 128 184
Total	**4 312 970**	**4 417 856**	**4 674 946**	**4 872 276**	**4 991 163**	**5 072 605**	**5 160 658**	**5 068 184**
Relative structure (in per cent)								
0-14	24.4	23.7	24.5	24.7	22.4	19.8	18.2	17.2
15-59	68.0	68.5	66.8	64.1	63.8	64.6	64.3	60.5
60+	7.6	7.7	8.7	11.2	13.8	15.6	17.5	22.3
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Index (2008=100%)								
0-14	100.0	99.6	108.9	114.3	106.2	95.6	89.3	82.9
15-59	100.0	103.2	106.5	106.5	108.6	111.7	113.2	104.6
60+	100.0	104.5	123.8	166.9	210.3	241.3	275.2	344.7
Total	**100.0**	**102.4**	**108.4**	**113.0**	**115.7**	**117.6**	**119.7**	**117.5**

Population forecast, Azerbaijan, 2008–2050, low variant, males, children and youth

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
0–2	242 476	246 556	252 706	220 427	188 029	186 022	188 412	156 924
3–5	205 232	235 200	251 137	242 704	203 693	183 868	192 054	165 040
6–10	296 340	307 726	396 995	418 846	390 873	328 695	315 361	297 589
11–14	308 682	258 832	245 885	321 438	335 490	307 415	244 272	252 677
15–18	373 084	348 792	243 725	261 793	324 443	333 872	251 121	253 468
19–23	466 564	474 194	422 738	300 607	339 053	406 218	362 295	306 323
Index (2008=100%)								
0–2	100.0	101.7	104.2	90.9	77.5	76.7	77.7	64.7
3–5	100.0	114.6	122.4	118.3	99.2	89.6	93.6	80.4
6–10	100.0	103.8	134.0	141.3	131.9	110.9	106.4	100.4
11–14	100.0	83.9	79.7	104.1	108.7	99.6	79.1	81.9
15–18	100.0	93.5	65.3	70.2	87.0	89.5	67.3	67.9
19–23	100.0	101.6	90.6	64.4	72.7	87.1	77.7	65.7

Population forecast, Azerbaijan, 2008–2050, low variant, males, elderly population

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
65+	245 983	231 769	247 320	301 885	423 518	539 092	635 454	752 317
75+	82 490	89 595	107 026	86 395	97 591	132 351	252 055	268 552
85+	9 815	9 914	15 156	18 169	21 821	14 948	31 184	58 899
Index (2008=100%)								
65+	100.0	94.2	100.5	122.7	172.2	219.2	258.3	305.8
75+	100.0	108.6	129.7	104.7	118.3	160.4	305.6	325.6
85+	100.0	101.0	154.4	185.1	222.3	152.3	317.7	600.1

Population forecast, Azerbaijan, 2008–2050, low variant, males, average age

Age	2008	2010	2015	2020	2025	2030	2040	2050
Average	30.31	30.69	31.63	32.84	34.38	35.86	38.01	39.80

Population forecast, Azerbaijan, 2008–2050, low variant, females, abridged age structure (as of 31.12. of a given year)

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
0	70 278	71 062	69 432	58 956	51 494	52 120	51 744	43 017
1–4	261 949	277 935	283 490	258 050	216 366	204 942	211 940	178 566
5–9	258 085	275 509	347 690	351 628	315 890	266 941	264 726	243 569
10–14	334 484	285 551	274 885	346 867	350 814	315 176	255 645	262 271
15–19	444 524	415 322	285 067	274 407	346 216	350 153	265 923	263 744
20–24	437 486	452 407	413 936	284 194	273 631	345 130	313 644	254 540
25–29	371 925	396 440	449 823	411 564	282 710	272 225	347 145	263 818
30–34	330 203	345 457	394 175	447 153	409 188	281 205	341 338	310 291
35–39	326 877	316 903	343 329	391 593	444 210	406 528	269 237	343 122
40–44	354 780	347 241	314 764	340 891	388 782	440 970	277 758	337 017
45–49	355 836	358 670	344 016	311 840	337 761	385 196	399 927	265 342
50–54	264 894	311 687	352 846	338 492	306 945	332 543	430 214	271 302
55–59	166 865	194 289	303 085	343 100	329 317	298 775	369 561	383 837
60–64	95 085	127 444	185 093	288 980	327 194	314 311	309 648	401 286
65–69	97 689	70 803	117 443	170 736	266 978	302 375	264 478	328 679
70–74	119 426	120 791	61 132	102 517	149 303	234 035	255 647	253 859
75–79	69 189	72 983	94 606	47 921	81 810	119 464	213 039	188 493
80–84	36 668	43 850	49 075	63 481	32 160	56 431	130 822	144 178
85–89	13 260	13 980	23 155	26 026	33 513	16 957	45 579	82 239
90–94	4 791	5 521	5 110	8 634	9 720	12 412	12 042	28 635
95–99	2 371	1 277	1 257	1 150	1 990	2 230	1 412	4 277
100+	666	758	217	179	158	267	376	392
Total	**4 417 331**	**4 505 879**	**4 713 625**	**4 868 359**	**4 956 151**	**5 010 386**	**5 031 846**	**4 852 475**
Index (2008=100%)								
0	100.0	101.1	98.8	83.9	73.3	74.2	73.6	61.2
1–4	100.0	106.1	108.2	98.5	82.6	78.2	80.9	68.2
5–9	100.0	106.8	134.7	136.2	122.4	103.4	102.6	94.4
10–14	100.0	85.4	82.2	103.7	104.9	94.2	76.4	78.4
15–19	100.0	93.4	64.1	61.7	77.9	78.8	59.8	59.3
20–24	100.0	103.4	94.6	65.0	62.5	78.9	71.7	58.2
25–29	100.0	106.6	120.9	110.7	76.0	73.2	93.3	70.9
30–34	100.0	104.6	119.4	135.4	123.9	85.2	103.4	94.0
35–39	100.0	96.9	105.0	119.8	135.9	124.4	82.4	105.0
40–44	100.0	97.9	88.7	96.1	109.6	124.3	78.3	95.0
45–49	100.0	100.8	96.7	87.6	94.9	108.3	112.4	74.6
50–54	100.0	117.7	133.2	127.8	115.9	125.5	162.4	102.4
55–59	100.0	116.4	181.6	205.6	197.4	179.1	221.5	230.0
60–64	100.0	134.0	194.7	303.9	344.1	330.6	325.7	422.0
65–69	100.0	72.5	120.2	174.8	273.3	309.5	270.7	336.5
70–74	100.0	101.1	51.2	85.8	125.0	196.0	214.1	212.6
75–79	100.0	105.5	136.7	69.3	118.2	172.7	307.9	272.4
80–84	100.0	119.6	133.8	173.1	87.7	153.9	356.8	393.2
85–89	100.0	105.4	174.6	196.3	252.7	127.9	343.7	620.2
90–94	100.0	115.2	106.7	180.2	202.9	259.1	251.3	597.7
95–99	100.0	53.9	53.0	48.5	83.9	94.1	59.5	180.4
100+	100.0	113.8	32.5	26.9	23.8	40.0	56.4	58.8
Total	**100.0**	**102.0**	**106.7**	**110.2**	**112.2**	**113.4**	**113.9**	**109.9**

Population forecast, Azerbaijan, 2008–2050, low variant, females, age groups

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
0-14	924 796	910 058	975 497	1 015 501	934 563	839 179	784 055	727 423
15-59	3 053 390	3 138 415	3 201 042	3 143 234	3 118 760	3 112 725	3 014 747	2 693 013
60+	439 145	457 406	537 087	709 624	902 827	1 058 482	1 233 043	1 432 038
Total	**4 417 331**	**4 505 879**	**4 713 625**	**4 868 359**	**4 956 151**	**5 010 386**	**5 031 846**	**4 852 475**
Relative structure (in per cent)								
0-14	20.9	20.2	20.7	20.9	18.9	16.7	15.6	15.0
15-59	69.1	69.7	67.9	64.6	62.9	62.1	59.9	55.5
60+	9.9	10.2	11.4	14.6	18.2	21.1	24.5	29.5
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Index (2008=100%)								
0-14	100.0	98.4	105.5	109.8	101.1	90.7	84.8	78.7
15-59	100.0	102.8	104.8	102.9	102.1	101.9	98.7	88.2
60+	100.0	104.2	122.3	161.6	205.6	241.0	280.8	326.1
Total	**100.0**	**102.0**	**106.7**	**110.2**	**112.2**	**113.4**	**113.9**	**109.9**

Population forecast, Azerbaijan, 2008–2050, low variant, females, children and youth

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
0–2	207 745	211 755	210 646	183 726	156 710	155 032	157 020	130 774
3–5	176 050	201 866	212 991	202 383	169 836	153 295	160 109	137 580
6–10	257 664	264 113	341 423	353 046	326 120	274 209	263 044	248 199
11–14	283 337	232 324	210 437	276 347	281 897	256 643	203 883	210 870
15–18	354 141	326 509	215 577	224 859	278 960	279 544	209 766	211 688
19–23	445 671	451 935	395 011	264 543	291 531	348 763	302 947	256 101
Index (2008=100%)								
0–2	100.0	101.9	101.4	88.4	75.4	74.6	75.6	62.9
3–5	100.0	114.7	121.0	115.0	96.5	87.1	90.9	78.1
6–10	100.0	102.5	132.5	137.0	126.6	106.4	102.1	96.3
11–14	100.0	82.0	74.3	97.5	99.5	90.6	72.0	74.4
15–18	100.0	92.2	60.9	63.5	78.8	78.9	59.2	59.8
19–23	100.0	101.4	88.6	59.4	65.4	78.3	68.0	57.5

Population forecast, Azerbaijan, 2008–2050, low variant, females, elderly population

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
65+	344 060	329 962	351 994	420 644	575 633	744 171	923 395	1 030 753
75+	126 945	138 368	173 420	147 391	159 352	207 761	403 270	448 214
85+	21 088	21 535	29 739	35 989	45 381	31 866	59 408	115 543
Index (2008=100%)								
65+	100.0	95.9	102.3	122.3	167.3	216.3	268.4	299.6
75+	100.0	109.0	136.6	116.1	125.5	163.7	317.7	353.1
85+	100.0	102.1	141.0	170.7	215.2	151.1	281.7	547.9

Population forecast, Azerbaijan, 2008–2050, low variant, females, average age

Age	2008	2010	2015	2020	2025	2030	2040	2050
Average	32.72	33.23	34.51	36.00	37.76	39.45	41.94	43.64

Population forecast, Azerbaijan, 2008–2050, low variant, total, abridged age structure (as of 31.12. of a given year)

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
0	152 086	154 182	152 737	129 697	113 285	114 663	113 837	94 640
1–4	567 429	601 718	621 369	567 581	475 920	450 806	466 212	392 808
5–9	557 525	596 977	752 765	770 974	694 572	586 982	582 153	535 649
10–14	700 486	605 494	595 350	750 664	768 872	692 728	561 954	576 557
15–19	913 323	857 229	604 139	594 004	748 895	767 059	584 219	579 494
20–24	894 396	926 747	853 993	601 994	591 999	746 190	688 695	558 959
25–29	748 026	807 769	920 920	848 607	598 466	588 606	759 679	578 959
30–34	637 548	675 648	801 550	913 654	842 066	594 112	736 184	679 656
35–39	618 623	601 416	670 049	794 416	905 507	834 688	579 772	747 789
40–44	668 704	654 219	595 733	663 252	786 113	895 892	583 745	722 945
45–49	679 397	678 105	644 721	587 115	653 662	774 511	813 920	566 657
50–54	509 302	596 797	661 382	629 141	573 279	638 375	861 942	562 453
55–59	317 059	368 160	571 503	633 652	603 487	550 350	726 463	763 870
60–64	176 354	237 540	343 048	533 355	592 040	564 768	574 883	777 153
65–69	174 163	126 451	213 179	308 399	480 620	534 164	467 018	618 409
70–74	206 445	207 317	105 690	180 344	261 589	408 987	436 506	447 895
75–79	119 534	124 564	156 027	79 687	138 629	201 789	353 231	313 316
80–84	58 998	71 950	79 523	99 941	51 112	91 508	211 502	229 008
85–89	19 682	21 117	35 756	39 832	50 166	25 660	70 342	125 360
90–94	6 891	7 536	7 236	12 555	14 072	17 702	17 762	42 391
95–99	3 193	1 751	1 619	1 547	2 757	3 092	1 977	6 133
100+	1 137	1 045	284	224	207	360	511	558
Total	**8730301**	**8923734**	**9388571**	**9740636**	**9947314**	**10082991**	**10192504**	**9920659**
Index (2008=100%)								
0	100.0	101.4	100.4	85.3	74.5	75.4	74.9	62.2
1–4	100.0	106.0	109.5	100.0	83.9	79.4	82.2	69.2
5–9	100.0	107.1	135.0	138.3	124.6	105.3	104.4	96.1
10–14	100.0	86.4	85.0	107.2	109.8	98.9	80.2	82.3
15–19	100.0	93.9	66.1	65.0	82.0	84.0	64.0	63.4
20–24	100.0	103.6	95.5	67.3	66.2	83.4	77.0	62.5
25–29	100.0	108.0	123.1	113.4	80.0	78.7	101.6	77.4
30–34	100.0	106.0	125.7	143.3	132.1	93.2	115.5	106.6
35–39	100.0	97.2	108.3	128.4	146.4	134.9	93.7	120.9
40–44	100.0	97.8	89.1	99.2	117.6	134.0	87.3	108.1
45–49	100.0	99.8	94.9	86.4	96.2	114.0	119.8	83.4
50–54	100.0	117.2	129.9	123.5	112.6	125.3	169.2	110.4
55–59	100.0	116.1	180.3	199.9	190.3	173.6	229.1	240.9
60–64	100.0	134.7	194.5	302.4	335.7	320.2	326.0	440.7
65–69	100.0	72.6	122.4	177.1	276.0	306.7	268.2	355.1
70–74	100.0	100.4	51.2	87.4	126.7	198.1	211.4	217.0
75–79	100.0	104.2	130.5	66.7	116.0	168.8	295.5	262.1
80–84	100.0	122.0	134.8	169.4	86.6	155.1	358.5	388.2
85–89	100.0	107.3	181.7	202.4	254.9	130.4	357.4	636.9
90–94	100.0	109.4	105.0	182.2	204.2	256.9	257.8	615.2
95–99	100.0	54.9	50.7	48.4	86.3	96.8	61.9	192.1
100+	100.0	91.9	25.0	19.7	18.2	31.6	45.0	49.1
Total	**100.0**	**102.2**	**107.5**	**111.6**	**113.9**	**115.5**	**116.7**	**113.6**

Population forecast, Azerbaijan, 2008–2050, low variant, total, age groups

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
0-14	1 977 526	1 958 372	2 122 219	2 218 916	2 052 649	1 845 179	1 724 154	1 599 654
15-59	5 986 378	6 166 091	6 323 989	6 265 835	6 303 474	6 389 783	6 334 618	5 760 783
60+	76 6397	799 272	942 362	1 255 884	1 591 191	1 848 030	2 133 732	2 560 223
Total	**8 730 301**	**8 923 734**	**9 388 571**	**9 740 636**	**9 947 314**	**10 082 991**	**10 192 504**	**9 920 659**
Relative structure (in per cent)								
0-14	22.7	21.9	22.6	22.8	20.6	18.3	16.9	16.1
15-59	68.6	69.1	67.4	64.3	63.4	63.4	62.1	58.1
60+	8.8	9.0	10.0	12.9	16.0	18.3	20.9	25.8
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Index (2008=100%)								
0-14	100.0	99.0	107.3	112.2	103.8	93.3	87.2	80.9
15-59	100.0	103.0	105.6	104.7	105.3	106.7	105.8	96.2
60+	100.0	104.3	123.0	163.9	207.6	241.1	278.4	334.1
Total	**100.0**	**102.2**	**107.5**	**111.6**	**113.9**	**115.5**	**116.7**	**113.6**

Population forecast, Azerbaijan, 2008–2050, low variant, total, children and youth

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
0–2	450 221	458 311	463 351	404 153	344 740	341 054	345 431	287 699
3–5	381 282	437 066	464 127	445 086	373 529	337 164	352 164	302 620
6–10	554 004	571 838	738 419	771 892	716 993	602 903	578 404	545 788
11–14	592 019	491 157	456 322	597 785	617 387	564 058	448 155	463 547
15–18	727 225	675 300	459 302	486 652	603 402	613 417	460 886	465 155
19–23	912 235	926 129	817 749	565 150	630 583	754 981	665 243	562 424
Index (2008=100%)								
0–2	100.0	101.8	102.9	89.8	76.6	75.8	76.7	63.9
3–5	100.0	114.6	121.7	116.7	98.0	88.4	92.4	79.4
6–10	100.0	103.2	133.3	139.3	129.4	108.8	104.4	98.5
11–14	100.0	83.0	77.1	101.0	104.3	95.3	75.7	78.3
15–18	100.0	92.9	63.2	66.9	83.0	84.4	63.4	64.0
19–23	100.0	101.5	89.6	62.0	69.1	82.8	72.9	61.7

Population forecast, Azerbaijan, 2008–2050, low variant, total, elderly population

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
65+	590 043	561 731	599 314	722 529	999 151	1 283 263	1 558 849	1 783 070
75+	209 435	227 963	280 445	233 786	256 943	340 111	655 325	716 765
85+	30 903	31 449	44895	54158	67 202	46 814	90 592	174 442
Index (2008=100%)								
65+	100.0	95.2	101.6	122.5	169.3	217.5	264.2	302.2
75+	100.0	108.8	133.9	111.6	122.7	162.4	312.9	342.2
85+	100.0	101.8	145.3	175.3	217.5	151.5	293.1	564.5

Population forecast, Azerbaijan, 2008–2050, low variant, total, average age

Age	2008	2010	2015	2020	2025	2030	2040	2050
Average	31.53	31.98	33.08	34.42	36.07	37.64	39.95	41.68

Population forecast, Azerbaijan, 2008–2050, high variant, males, abridged age structure (as of 31.12. of a given year)

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
0	81 808	83 854	84 467	74 362	66 839	70 118	79 510	73 275
1–4	305 480	324 251	340 227	319 883	277 395	270 344	315 450	297 208
5–9	299 440	321 551	406 906	423 763	393 631	343 835	370 950	388 262
10–14	366 002	320 009	321 030	406 439	423 459	393 451	340 141	394 725
15–19	468 799	441 988	319 582	320 828	406 213	423 258	343 789	370 986
20–24	456 910	474 450	440 797	319 143	320 576	405 720	392 967	340 049
25–29	376 101	411 523	472 477	439 521	318 785	320 309	422 185	343 448
30–34	307 345	330 430	409 271	470 553	438 374	318 518	404 685	392 387
35–39	291 746	284 783	328 947	408 015	469 549	437 879	320 863	422 107
40–44	313 924	307 322	283 444	328 190	407 255	468 490	319 897	405 515
45–49	323 561	319 784	303 156	280 852	325 727	404 002	434 416	321 034
50–54	244 408	285 501	310 959	295 991	275 167	319 509	456 416	314 135
55–59	150 194	174 288	271 430	296 995	284 082	265 030	383 602	414 711
60–64	81 269	110 480	160 729	252 297	277 746	267 137	292 578	421 985
65–69	76 474	55 947	98 153	144 337	228 672	253 322	231 201	340 289
70–74	87 019	87 220	46 353	83 435	124 323	199 084	217 109	244 168
75–79	50 345	52 221	65 109	35 550	66 257	100 294	183 809	174 766
80–84	22 330	28 635	33 277	43 074	24 297	47 357	121 211	139 677
85–89	6 422	7 346	14 390	17 714	23 993	14 020	45 921	91 140
90–94	2 100	2 100	2 589	5 626	7 390	10 484	14 151	40 815
95–99	822	502	477	666	1 598	2 225	2 105	8 617
100+	471	306	97	91	134	327	785	1 338
Total	**4 312 970**	**4 424 492**	**4 713 865**	**4 967 324**	**5 161 462**	**5 334 713**	**5 693 742**	**5 940 639**
Index (2008=100%)								
0	100.0	102.5	103.3	90.9	81.7	85.7	97.2	89.6
1–4	100.0	106.1	111.4	104.7	90.8	88.5	103.3	97.3
5–9	100.0	107.4	135.9	141.5	131.5	114.8	123.9	129.7
10–14	100.0	87.4	87.7	111.0	115.7	107.5	92.9	107.8
15–19	100.0	94.3	68.2	68.4	86.6	90.3	73.3	79.1
20–24	100.0	103.8	96.5	69.8	70.2	88.8	86.0	74.4
25–29	100.0	109.4	125.6	116.9	84.8	85.2	112.3	91.3
30–34	100.0	107.5	133.2	153.1	142.6	103.6	131.7	127.7
35–39	100.0	97.6	112.8	139.9	160.9	150.1	110.0	144.7
40–44	100.0	97.9	90.3	104.5	129.7	149.2	101.9	129.2
45–49	100.0	98.8	93.7	86.8	100.7	124.9	134.3	99.2
50–54	100.0	116.8	127.2	121.1	112.6	130.7	186.7	128.5
55–59	100.0	116.0	180.7	197.7	189.1	176.5	255.4	276.1
60–64	100.0	135.9	197.8	310.4	341.8	328.7	360.0	519.2
65–69	100.0	73.2	128.3	188.7	299.0	331.3	302.3	445.0
70–74	100.0	100.2	53.3	95.9	142.9	228.8	249.5	280.6
75–79	100.0	103.7	129.3	70.6	131.6	199.2	365.1	347.1
80–84	100.0	128.2	149.0	192.9	108.8	212.1	542.8	625.5
85–89	100.0	114.4	224.1	275.8	373.6	218.3	715.1	1419.2
90–94	100.0	100.0	123.3	267.9	351.9	499.2	673.9	1943.6
95–99	100.0	61.1	58.0	81.0	194.4	270.7	256.1	1048.3
100+	100.0	65.0	20.5	19.3	28.4	69.5	166.6	284.1
Total	**100.0**	**102.6**	**109.3**	**115.2**	**119.7**	**123.7**	**132.0**	**137.7**

Population forecast, Azerbaijan, 2008–2050, high variant, males, age groups

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
0-14	1 052 730	1 049 666	1 152 629	1 224 447	1 161 324	1 077 748	1 106 051	1 153 470
15-59	2 932 988	3 030 068	3 140 062	3 160 088	3 245 728	3 362 715	3 478 821	3 324 373
60+	327 252	344 758	421 173	582 789	754 410	894 251	1 108 870	1 462 796
Total	**4 312 970**	**4 424 492**	**4 713 865**	**4 967 324**	**5 161 462**	**5 334 713**	**5 693 742**	**5 940 639**
Relative structure (in per cent)								
0-14	24.4	23.7	24.5	24.7	22.5	20.2	19.4	19.4
15-59	68.0	68.5	66.6	63.6	62.9	63.0	61.1	56.0
60+	7.6	7.8	8.9	11.7	14.6	16.8	19.5	24.6
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Index (2008=100%)								
0-14	100.0	99.7	109.5	116.3	110.3	102.4	105.1	109.6
15-59	100.0	103.3	107.1	107.7	110.7	114.7	118.6	113.3
60+	100.0	105.3	128.7	178.1	230.5	273.3	338.8	447.0
Total	**100.0**	**102.6**	**109.3**	**115.2**	**119.7**	**123.7**	**132.0**	**137.7**

Population forecast, Azerbaijan, 2008–2050, high variant, males, children and youth

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
0–2	242 476	247 712	254 916	230 139	202 466	206 722	238 304	220 708
3–5	205 232	235 265	253 301	248 311	215 953	200 451	233 535	225 847
6–10	296 340	307 804	398 096	422 956	403 567	351 260	364 058	391 600
11–14	308 682	258 885	246 317	323 041	339 338	319 315	270 155	315 315
15–18	373 084	348 855	244 122	262 793	327 504	338 945	271 979	299 627
19–23	466 564	474 291	423 405	301854	341 277	411 418	382 101	344 777
Index (2008=100%)								
0–2	100.0	102.2	105.1	94.9	83.5	85.3	98.3	91.0
3–5	100.0	114.6	123.4	121.0	105.2	97.7	113.8	110.0
6–10	100.0	103.9	134.3	142.7	136.2	118.5	122.9	132.1
11–14	100.0	83.9	79.8	104.7	109.9	103.4	87.5	102.1
15–18	100.0	93.5	65.4	70.4	87.8	90.8	72.9	80.3
19–23	100.0	101.7	90.7	64.7	73.1	88.2	81.9	73.9

Population forecast, Azerbaijan, 2008–2050, high variant, males, elderly population

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
65+	245 983	234 278	260 444	330 492	476 664	627 113	816 292	1 040 811
75+	82 490	91 111	115 939	102 720	123 669	174 707	367 983	456 354
85+	9 815	10 255	17 553	24 097	33 115	27 056	62 962	141 911
Index (2008=100%)								
65+	100.0	95.2	105.9	134.4	193.8	254.9	331.8	423.1
75+	100.0	110.5	140.5	124.5	149.9	211.8	446.1	553.2
85+	100.0	104.5	178.8	245.5	337.4	275.7	641.5	1445.9

Population forecast, Azerbaijan, 2008–2050, high variant, males, average age

Age	2008	2010	2015	2020	2025	2030	2040	2050
Average	30.31	30.72	31.78	33.10	34.74	36.31	38.48	40.10

Population forecast, Azerbaijan, 2008–2050, high variant, females, abridged age structure (as of 31.12. of a given year)

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
0	70 278	74 226	77 509	68 239	61 343	64 361	72 992	67 261
1–4	261 949	279 574	308 065	293 592	254 610	248 178	289 630	272 848
5–9	258 085	275 571	352 967	384 911	361 416	315 709	340 674	356 561
10–14	334 484	285 605	275 331	352 782	384 828	361 410	312 472	362 613
15–19	444 524	415 403	285 590	275 550	353 038	385 085	316 174	341 185
20–24	437 486	452 562	414 941	285 822	276 028	353 398	362 127	313 425
25–29	371 925	396 635	451 456	414 554	286 190	276 488	385 696	317 185
30–34	330 203	345 631	395 784	450 990	414 632	286 722	354 141	362 986
35–39	326 877	317 080	344 855	395 368	450 802	414 706	277 821	386 571
40–44	354 780	347 411	316 154	344 350	395 037	450 345	287 847	355 036
45–49	355 836	358 831	345 211	314 737	343 117	393 626	413 242	278 214
50–54	264 894	311 883	354 117	341 287	311 673	340 031	444 993	285 611
55–59	166 865	194 497	304 647	346 620	334 805	306 304	384 417	404 584
60–64	95 085	127 680	186 732	293 667	335 183	324 758	326 084	428 862
65–69	97 689	71 047	119 232	175 570	277 832	318 590	285 496	361 958
70–74	119 426	121 459	62 788	107 406	159 747	255 073	288 313	294 842
75–79	69 189	73 621	98 606	51 941	91 389	137 836	259 180	239 422
80–84	36 668	44 434	52 263	71 679	38 663	70 797	178 315	210 404
85–89	13 260	14 247	25 357	31 043	43 759	24 232	73 196	146 835
90–94	4 791	5 653	5 768	10 941	13 951	20 149	23 539	65 534
95–99	2 371	1 308	1 440	1 527	3 081	4 039	3 371	12 761
100+	666	770	241	234	247	497	972	1 423
Total	**4 417 331**	**4 515 128**	**4 779 051**	**5 012 809**	**5 191 371**	**5 352 333**	**5 680 691**	**5 866 121**
Index (2008=100%)								
0	100.0	105.6	110.3	97.1	87.3	91.6	103.9	95.7
1–4	100.0	106.7	117.6	112.1	97.2	94.7	110.6	104.2
5–9	100.0	106.8	136.8	149.1	140.0	122.3	132.0	138.2
10–14	100.0	85.4	82.3	105.5	115.1	108.0	93.4	108.4
15–19	100.0	93.4	64.2	62.0	79.4	86.6	71.1	76.8
20–24	100.0	103.4	94.8	65.3	63.1	80.8	82.8	71.6
25–29	100.0	106.6	121.4	111.5	76.9	74.3	103.7	85.3
30–34	100.0	104.7	119.9	136.6	125.6	86.8	107.2	109.9
35–39	100.0	97.0	105.5	121.0	137.9	126.9	85.0	118.3
40–44	100.0	97.9	89.1	97.1	111.3	126.9	81.1	100.1
45–49	100.0	100.8	97.0	88.5	96.4	110.6	116.1	78.2
50–54	100.0	117.7	133.7	128.8	117.7	128.4	168.0	107.8
55–59	100.0	116.6	182.6	207.7	200.6	183.6	230.4	242.5
60–64	100.0	134.3	196.4	308.8	352.5	341.5	342.9	451.0
65–69	100.0	72.7	122.1	179.7	284.4	326.1	292.3	370.5
70–74	100.0	101.7	52.6	89.9	133.8	213.6	241.4	246.9
75–79	100.0	106.4	142.5	75.1	132.1	199.2	374.6	346.0
80–84	100.0	121.2	142.5	195.5	105.4	193.1	486.3	573.8
85–89	100.0	107.4	191.2	234.1	330.0	182.7	552.0	1107.3
90–94	100.0	118.0	120.4	228.4	291.2	420.6	491.3	1367.9
95–99	100.0	55.2	60.7	64.4	129.9	170.4	142.2	538.2
100+	100.0	115.6	36.1	35.2	37.1	74.6	145.9	213.7
Total	**100.0**	**102.2**	**108.2**	**113.5**	**117.5**	**121.2**	**128.6**	**132.8**
	100.0	105.6	110.3	97.1	87.3	91.6	103.9	95.7

Population forecast, Azerbaijan, 2008–2050, high variant, females, age groups

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
0-14	924 796	914 977	1 013 871	1 099 525	1 062 196	989 658	1 015 769	1 059 283
15-59	3 053 390	3 139 933	3 212 753	3 169 277	3 165 322	3 206 703	3 226 457	3 044 798
60+	439 145	460 219	552 427	744 007	963 852	1 155 971	1 438 465	1 762 040
Total	**4 417 331**	**4 515 128**	**4 779 051**	**5 012 809**	**5 191 371**	**5 352 333**	**5 680 691**	**5 866 121**
Relative structure (in per cent)								
0-14	20.9	20.3	21.2	21.9	20.5	18.5	17.9	18.1
15-59	69.1	69.5	67.2	63.2	61.0	59.9	56.8	51.9
60+	9.9	10.2	11.6	14.8	18.6	21.6	25.3	30.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Index (2008=100%)								
0-14	100.0	98.9	109.6	118.9	114.9	107.0	109.8	114.5
15-59	100.0	102.8	105.2	103.8	103.7	105.0	105.7	99.7
60+	100.0	104.8	125.8	169.4	219.5	263.2	327.6	401.2
Total	**100.0**	**102.2**	**108.2**	**113.5**	**117.5**	**121.2**	**128.6**	**132.8**

Population forecast, Azerbaijan, 2008–2050, high variant, females, children and youth

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
0–2	207 745	216 524	233 219	211 200	185 820	189 757	218 778	202 599
3–5	176 050	201 916	226 327	227 934	198 235	184 031	214 443	207 363
6–10	257 664	264 169	343 544	381 514	370 574	322 545	334 359	359 647
11–14	283 337	232 368	210 781	278 878	307 567	293 325	248 189	289 675
15–18	354 141	326 571	215 972	225 764	285 340	309 543	250 081	275 502
19–23	445 671	452 071	395 882	265 990	293 838	361 172	351 979	317 642
Index (2008=100%)								
0–2	100.0	104.2	112.3	101.7	89.4	91.3	105.3	97.5
3–5	100.0	114.7	128.6	129.5	112.6	104.5	121.8	117.8
6–10	100.0	102.5	133.3	148.1	143.8	125.2	129.8	139.6
11–14	100.0	82.0	74.4	98.4	108.6	103.5	87.6	102.2
15–18	100.0	92.2	61.0	63.7	80.6	87.4	70.6	77.8
19–23	100.0	101.4	88.8	59.7	65.9	81.0	79.0	71.3

Population forecast, Azerbaijan, 2008–2050, high variant, females, elderly population

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
65+	344 060	332 539	365 695	450 341	628 669	831 213	1 112 381	1 333 178
75+	126 945	140 033	183 675	167 364	191 090	257 550	538 572	676 378
85+	21 088	21 979	32 806	43 745	61 038	48 916	101 077	226 552
Index (2008=100%)								
65+	100.0	96.7	106.3	130.9	182.7	241.6	323.3	387.5
75+	100.0	110.3	144.7	131.8	150.5	202.9	424.3	532.8
85+	100.0	104.2	155.6	207.4	289.4	232.0	479.3	1074.3

Population forecast, Azerbaijan, 2008–2050, high variant, females, average age

Age	2008	2010	2015	2020	2025	2030	2040	2050
Average	32.72	33.22	34.41	35.79	37.45	39.07	41.36	42.80

Population forecast, Azerbaijan, 2008–2050, high variant, total, abridged age structure (as of 31.12. of a given year)

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
0	152 086	158 081	161 976	142 601	128 182	134 479	152 502	140 536
1–4	567 429	603 826	648 291	613 476	532 004	518 523	605 081	570 057
5–9	557 525	597 122	759 872	808 674	755 047	659 543	711 624	744 822
10–14	700 486	605 614	596 361	759 221	808 287	754 861	652 613	757 338
15–19	913 323	857 391	605 172	596 378	759 252	808 342	659 963	712 172
20–24	894 396	927 011	855 737	604 965	596 604	759 118	755 094	653 474
25–29	748 026	808 159	923 933	854 075	604 975	596 796	807 881	660 633
30–34	637 548	676 061	805 055	921 543	853 006	605 239	758 826	755 373
35–39	618 623	601 863	673 802	803 383	920 351	852 584	598 684	808 679
40–44	668 704	654 733	599 598	672 539	802 292	918 835	607 744	760 551
45–49	679 397	678 616	648 367	595 589	668 844	797 628	847 658	599 248
50–54	509 302	597 384	665 075	637 278	586 840	659 540	901 409	599 746
55–59	317 059	368 785	576 077	643 615	618 886	571 334	768 019	819 295
60–64	176 354	238 159	347 461	545 963	612 929	591 895	618 662	850 846
65–69	174 163	126 994	217 384	319 908	506 504	571 912	516 697	702 247
70–74	206 445	208 679	109 140	190 841	284 071	454 158	505 422	539 010
75–79	119 534	125 842	163 715	87 490	157 646	238 130	442 989	414 188
80–84	58 998	73 069	85 540	114 753	62 960	118 154	299 526	350 081
85–89	19 682	21 593	39 748	48 757	67 751	38 252	119 117	237 975
90–94	6 891	7 753	8 358	16 567	21 341	30 633	37 690	106 349
95–99	3 193	1 810	1 917	2 192	4 679	6 264	5 476	21 378
100+	1 137	1 077	337	325	381	824	1 756	2 761
Total	**8 730 301**	**8 939 620**	**9 492 916**	**9 980 133**	**10 352 834**	**10 687 046**	**11 374 433**	**11 806 760**
Index (2008=100%)								
0	100.0	103.9	106.5	93.8	84.3	88.4	100.3	92.4
1–4	100.0	106.4	114.3	108.1	93.8	91.4	106.6	100.5
5–9	100.0	107.1	136.3	145.0	135.4	118.3	127.6	133.6
10–14	100.0	86.5	85.1	108.4	115.4	107.8	93.2	108.1
15–19	100.0	93.9	66.3	65.3	83.1	88.5	72.3	78.0
20–24	100.0	103.6	95.7	67.6	66.7	84.9	84.4	73.1
25–29	100.0	108.0	123.5	114.2	80.9	79.8	108.0	88.3
30–34	100.0	106.0	126.3	144.5	133.8	94.9	119.0	118.5
35–39	100.0	97.3	108.9	129.9	148.8	137.8	96.8	130.7
40–44	100.0	97.9	89.7	100.6	120.0	137.4	90.9	113.7
45–49	100.0	99.9	95.4	87.7	98.4	117.4	124.8	88.2
50–54	100.0	117.3	130.6	125.1	115.2	129.5	177.0	117.8
55–59	100.0	116.3	181.7	203.0	195.2	180.2	242.2	258.4
60–64	100.0	135.0	197.0	309.6	347.6	335.6	350.8	482.5
65–69	100.0	72.9	124.8	183.7	290.8	328.4	296.7	403.2
70–74	100.0	101.1	52.9	92.4	137.6	220.0	244.8	261.1
75–79	100.0	105.3	137.0	73.2	131.9	199.2	370.6	346.5
80–84	100.0	123.8	145.0	194.5	106.7	200.3	507.7	593.4
85–89	100.0	109.7	201.9	247.7	344.2	194.3	605.2	1209.1
90–94	100.0	112.5	121.3	240.4	309.7	444.5	546.9	1543.3
95–99	100.0	56.7	60.0	68.7	146.5	196.2	171.5	669.5
100+	100.0	94.7	29.7	28.6	33.5	72.5	154.5	242.8
Total	**100.0**	**102.4**	**108.7**	**114.3**	**118.6**	**122.4**	**130.3**	**135.2**

Population forecast, Azerbaijan, 2008–2050, high variant, total, age groups

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
0-14	1 977 526	1 964 643	2 166 501	2 323 972	2 223 520	2 067 406	2 121 820	2 212 753
15-59	5 986 378	6 170 001	6 352 816	6 329 365	6 411 050	6 569 418	6 705 278	6 369 171
60+	766 397	804 977	973 600	1 326 797	1 718 263	2 050 222	2 547 335	3 224 836
Total	**8 730 301**	**8 939 620**	**9 492 916**	**9 980 133**	**10 352 834**	**10 687 046**	**11 374 433**	**11 806 760**
Relative structure (in per cent)								
0-14	22.7	22.0	22.8	23.3	21.5	19.3	18.7	18.7
15-59	68.6	69.0	66.9	63.4	61.9	61.5	59.0	53.9
60+	8.8	9.0	10.3	13.3	16.6	19.2	22.4	27.3
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Index (2008=100%)								
0-14	100.0	99.3	109.6	117.5	112.4	104.5	107.3	111.9
15-59	100.0	103.1	106.1	105.7	107.1	109.7	112.0	106.4
60+	100.0	105.0	127.0	173.1	224.2	267.5	332.4	420.8
Total	**100.0**	**102.4**	**108.7**	**114.3**	**118.6**	**122.4**	**130.3**	**135.2**

Population forecast, Azerbaijan, 2008–2050, high variant, total, children and youth

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
0–2	450 221	464 236	488 134	441 339	388 286	396 480	457 081	423 307
3–5	381 282	437 181	479 628	476 245	414 188	384 482	447 978	433 210
6–10	554 004	571 973	741 640	804 469	774 141	673 805	698 417	751 247
11–14	592 019	491 252	457 098	601 919	646 905	612 640	518 343	604 990
15–18	727 225	675 426	460 093	488 556	612 845	648 488	522 060	575 129
19–23	912 235	926 361	819 286	567 844	635 114	772 590	734 080	662 419
Index (2008=100%)								
0–2	100.0	103.1	108.4	98.0	86.2	88.1	101.5	94.0
3–5	100.0	114.7	125.8	124.9	108.6	100.8	117.5	113.6
6–10	100.0	103.2	133.9	145.2	139.7	121.6	126.1	135.6
11–14	100.0	83.0	77.2	101.7	109.3	103.5	87.6	102.2
15–18	100.0	92.9	63.3	67.2	84.3	89.2	71.8	79.1
19–23	100.0	101.5	89.8	62.2	69.6	84.7	80.5	72.6

Population forecast, Azerbaijan, 2008–2050, high variant, total, elderly population

Age	2008	2010	2015	2020	2025	2030	2040	2050
Absolute numbers								
65+	590 043	566 817	626 139	780 833	1 105 333	1 458 326	1 928 673	2 373 989
75+	209 435	231 144	299 615	270 085	314 758	432 257	906 555	1 132 732
85+	30 903	32 233	50 360	67 841	94 152	75 973	164 040	368 463
Index (2008=100%)								
65+	100.0	96.1	106.1	132.3	187.3	247.2	326.9	402.3
75+	100.0	110.4	143.1	129.0	150.3	206.4	432.9	540.9
85+	100.0	104.3	163.0	219.5	304.7	245.8	530.8	1192.3

Population forecast, Azerbaijan, 2008–2050, high variant, total, average age

Age	2008	2010	2015	2020	2025	2030	2040	2050
Average	31.53	31.99	33.10	34.45	36.10	37.69	39.93	41.44